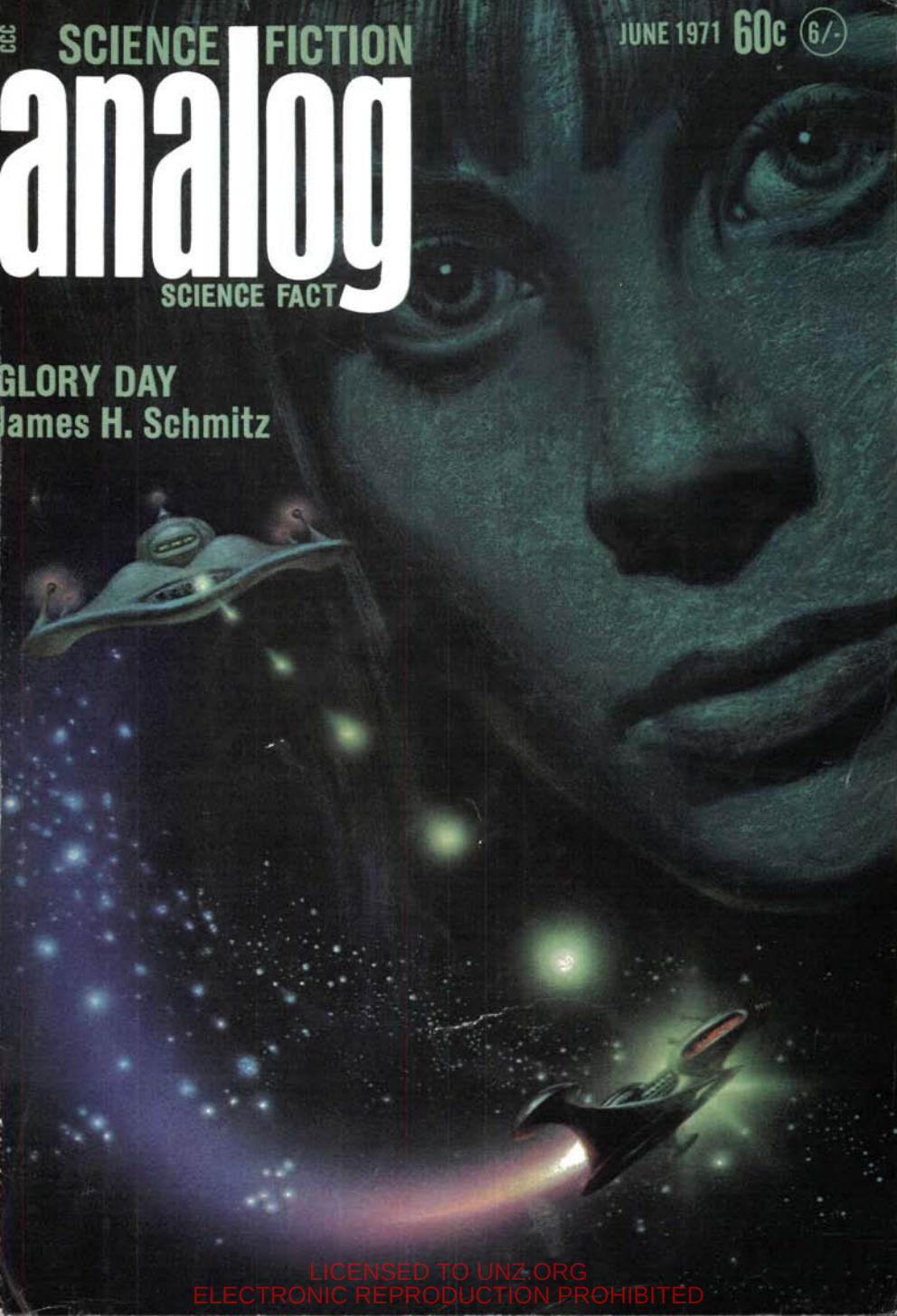


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# "bargain spacement"

AN EDITORIAL BY JOHN W. CAMPBELL

One of the pleasant things about the job of editing this magazine is that I can legitimately take time off to watch such events as the Apollo Moon walks and splashdown. And the Apollo 14 splashdown was really something worth watching—on color TV, of course, because those on the scene couldn't see as well what was happening.

As Walter Schirra said, while being the ex-astronaut-commentator on the CBS network, "I'm seeing this better than I did during my own training!"

The coverage of Apollo 14 was far superior to that of previous splashdowns—thanks, in large part, to the fact that the U.S. Navy's helicopter-carrier *New Orleans,* that managed the recovery, is primarily an anti-submarine warfare ship, with the finest and latest in antisub gear.

The photo-helicopter that carried the TV and movie cameras is specially equipped for photo-surveillance; it has specially designed gyro-stabilized stable-platform mounts for long-range cameras and certain less widely publicized gear. The stable platform stays level, despite pitching, yawing and rolling motions of the helicopter. Anyone who's used a pair of binoculars, a hand-held telescope, or a telescopic lens on his camera knows how those optical gadgets magnify the slightest motions. Without the stable platform, the really long-reach camera lenses are worse than useless; motion produces blur that destroys the picture entirely. With it, the long-lenses brought the apparent viewpoint closer to the descending Apollo capsule than any human being could get, while maintaining such astonishingly high resolution that the seams in the metal capsule were visible.

And it was a beautiful picture—the bright orange parachutes against the clear blue sky, with the gray-green ocean below.

And since the capsule was picked up by the photo-ship *before* the



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drogue chutes opened, they must have been (1) using an exceedingly long-focus lens, and (2) Shepherd, Mitchell, Roosa & Co. must have come in with the same sort of 87-foot accuracy that they achieved on the Moon.

Apollo 14 was a complete success—and demonstrated several points that merit some careful evaluation for the whole future Space program.

Item No. 1 is the matter of the difference between a "glitch" and a disaster. A glitch is a malfunction, or misfunction, that can be overcome with a little ingenuity and some unorthodox procedure; a disaster is an irreversible and unrecoverable breakdown.

But the important hidden-assumption factor in that is the question of what means for recovery are available. On Apollo 13 there was a semi-disaster; the mission had to be aborted because of the irreplaceable loss of the oxygen supplies needed to power both the fuel cells and the human crew. However, it was partially overcome by the ingenuity of the human crew plus the engineering crew on Earth—and the forethought of the planners who designed and built the Apollos. The Lunar lander had originally been designed with the thought in mind that it could serve as a rescue system in case the service module became inoperative for some reason.

But this depended on the human crew applying unorthodox procedures, and flanging up jury-rigs that weren't supposed to be possible. The loss of the fuel cells meant there was no electrical power supply to charge the small batteries in the absolutely essential command capsule; those batteries are normally kept charged by the fuel cells until the last half hour or so after the service module has been separated for the final passage through the atmosphere and splashdown, not for the many hours that were involved in Apollo 13's return.

Without the fuel cells, there was no way of getting power to them to recharge them for reentry—unless somebody rewired the electrical system of both the LEM and the Command capsule.

The batteries used in the Command capsule are rechargeable silver-zinc cells; it takes about 35 volts to push charge into them. The fuel cells deliver between 28 and 32 volts, depending on load; the fuel-cell current was, normally, fed into a "DC transformer"—a solid-state oscillator that converted the battery current to AC, a transformer that stepped up the voltage, and a regulator-rectifier system that reconverted to DC at the desired voltage.

The descent stage of the LEM is powered by big—thousands of ampere-hours—silver-zinc batteries of the primary type—i.e., like ordinary dry calls, they can't be recharged. (That type can be made more compact to store more energy per pound, and in the intended use, it's a one-



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way, one-shot application anyway.) So there was plenty of stored electrical energy in the LEM—which couldn't reenter the atmosphere. And not enough in the Command capsule, which had to reenter. And the LEM battery, which had plenty of power, didn't have a high enough voltage. Since it hadn't been designed to be a power-source for the Command capsule, it had no "DC transformer".

The answer was relatively simple—just run a cable from the big LEM battery to the DC transformer the fuel cells normally fed, and recharge the Command capsule battery that way.

Very simple—if there's a competent man on board to do it. Not quite so simple if you're trying to remote control it through radio links, however.

The glitch of power supply on Apollo 13, then, was a glitch, not a disaster, because men were there to carry out ingenious, and unorthodox procedures.

This makes the difference between a glitch and a disaster come down to "Who's there to do something about it?"

The first glitch of Apollo 14 was the failure of the docking mechanism to behave as it was supposed to. It wasn't anything serious—the crew simply by-passed the recalcitrant probe-and-drogue equipment, and made a direct "hard dock" with the LEM.

Without the crew, it would have been a disaster, however; the crew did something that the equipment wasn't designed to be able to do.

Then there was that other glitch, when the computer got zonked somehow, and signaled "ABORT"—and would have automatically thrown the ascent stage into operation, discarding the descent stage entirely, if they'd been in process of making a landing at the time.

Obviously, without the crew, that would have been a disaster so far as the Lunar mission was concerned. The machinery might have successfully completed the program, and returned the Command capsule safely to Earth—which would have been interesting, but pretty futile if no Lunar work had been accomplished. The aborted mission would have cost just as much, of course, as the successful mission—roughly, $400 millions.

However, the crew, with the help of a young computer program designer at MIT, some 200,000 miles away, converted the potential disaster into a simple glitch; they determined what the cause of the false signal was, and the program expert designed a new program that by-passed that section of the computer completely.

That, incidentally, is quite a neat trick; the trouble was caused by a defective switch—a failure of the computer hardware. The program designer, in effect, "fixed" the defective hardware, by redesigning the software, the program.



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This is more-or-less equivalent to what happens when a dog has an injured leg; he reprograms his neuromuscular coordination program, and develops a three-legged gait that bypasses the defective "hardware."

(Horses, incidentally, are unable to do this; that's why a horse that broke a leg had to be shot, while a dog could simply be splinted for a while. The horse's computer can't be reprogrammed.)

I've commented that the unmanned, instrumented-probe type mission equivalent to Apollo 14 would have cost nearly as much as the manned mission did, but "everybody knows" that instrumented, but unmanned, probes are much cheaper. We have the Russians' word for it!

The Russians' unmanned probes, so far, are of two types: First, a soft-lander that collected a small sample, and returned to Earth with it, and second, the Lunokhod Moon-crawler that crawls around examining the surface.

The first brought back a couple of heaping tablespoons of Moon dust, contaminated with gases from the landing rockets, and with no selectivity.

Apollo 14 brought back nearly 100 pounds of rocks carefully selected by well-trained geologist-astronauts, well documented as to the conditions under which they were found.

The Russian achievement was real, and I'm not downgrading it—but I do want a little honest evaluation. It was *not* equivalent to getting selected, documented, and massive samples.

The most fascinating questions to be answered by the Lunar material has to do with the age of the Moon. The small and unselected sample isn't apt to reveal much in that department.

Lunokhod, on the other hand, has TV eyes and manipulators with which it can select samples. It has various X-ray and nuclear test equipment with which it can report on simple analyses—but for real analysis of Lunar material extremely sophisticated and very massive equipment is essential. A scanning electron microscope is a bit too complex to fit in a Lunokhod type device, for instance. The material has to be returned to Earth for analysis.

And this Lunokhod alone can't do; what can be done, of course, is to send two soft-landers to the Moon, one carrying a Lunokhod, and one carrying a reascent capsule capable of the round-trip journey back to Earth, with the load of samples Lunokhod has been directed to pick up and put in the second soft-lander.

That method would give carefully selected samples, from a fairly wide area in the vicinity of the landers, and bring them back uncontaminated to Earth.

Only . . . well, let's see; this requires two launch vehicles capable of boosting pretty large-scale soft-

*continued on page 176*



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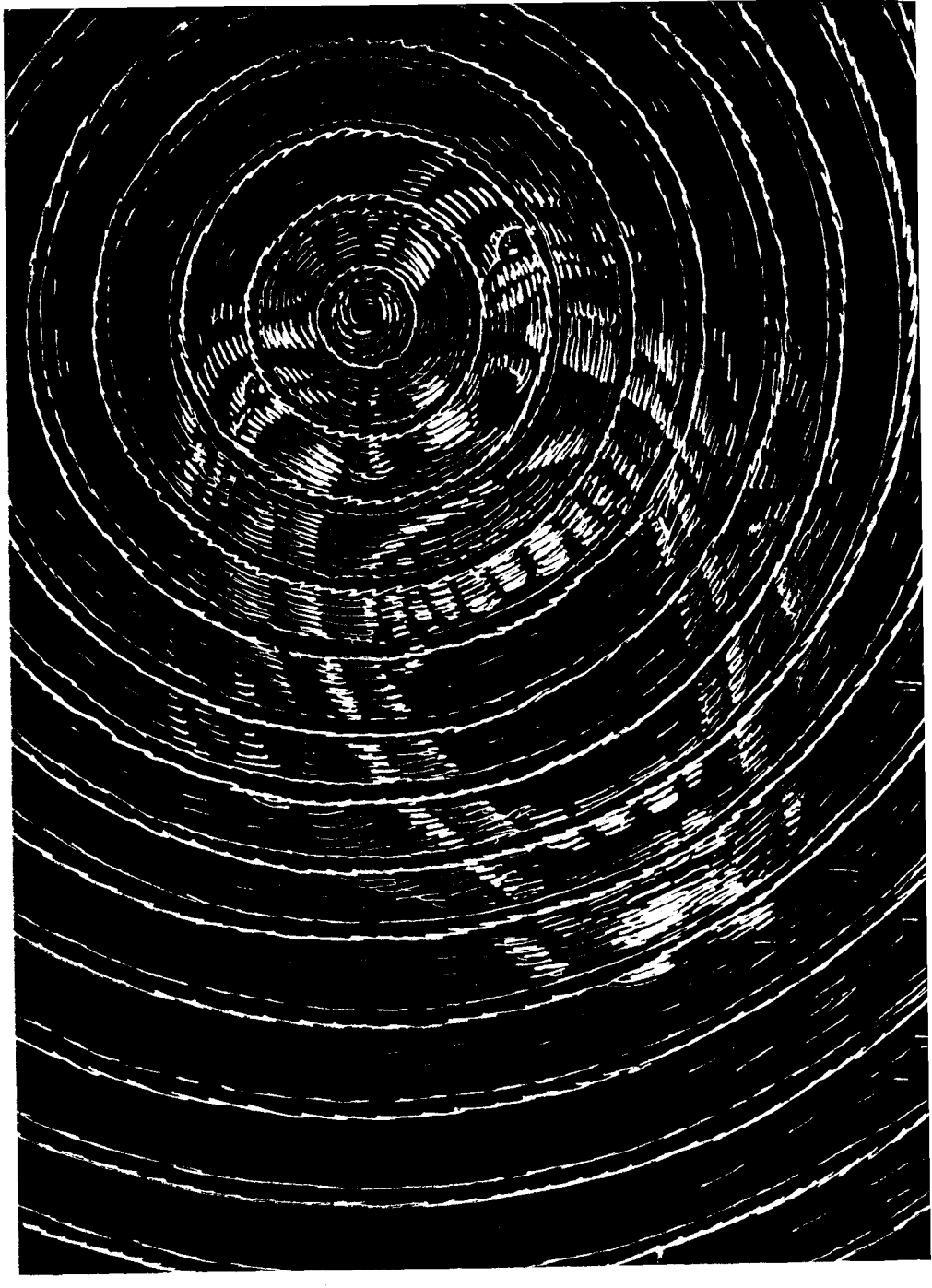

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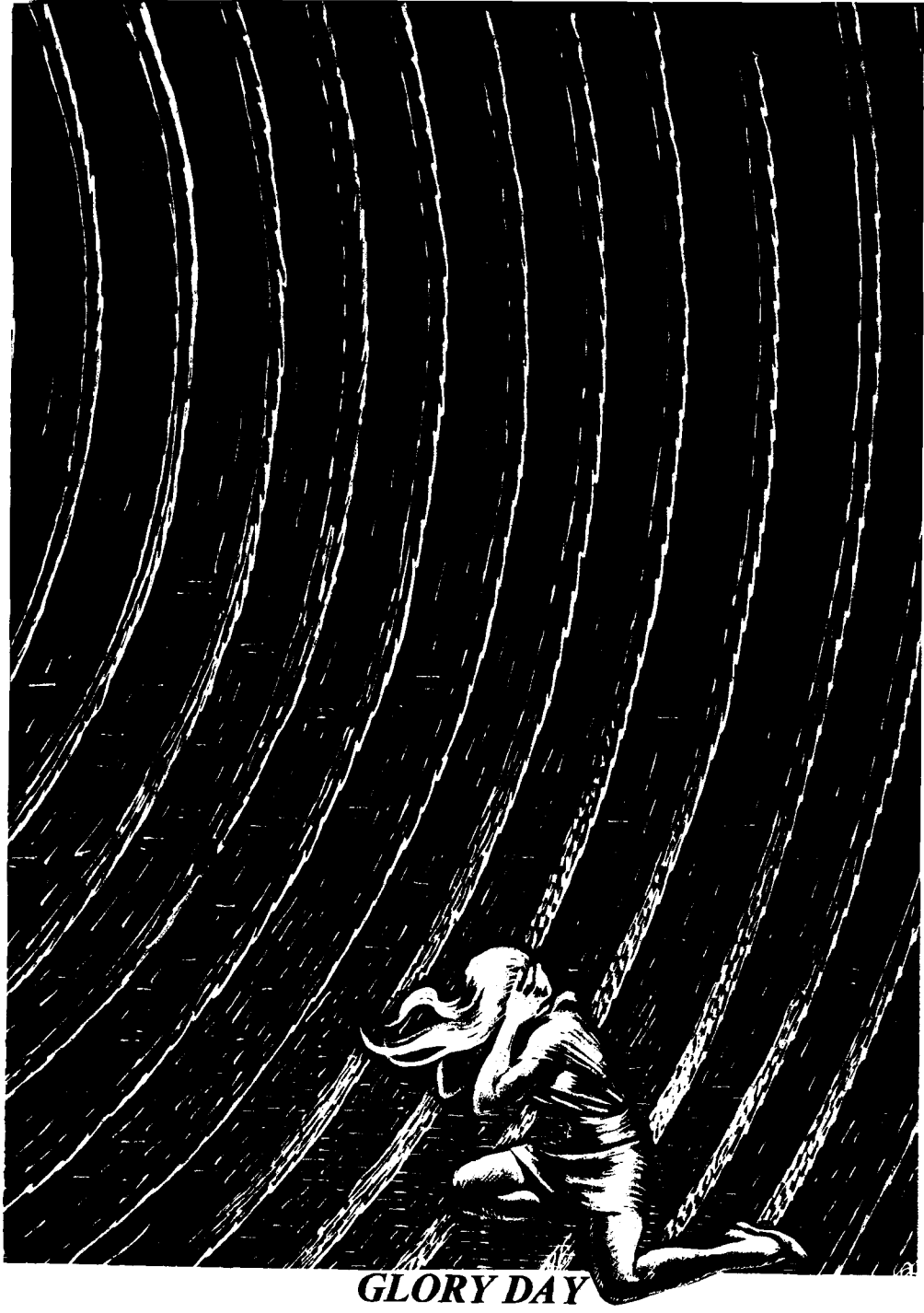

GLORY DAY

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Telzey was in a spot, but she wasn t the type to howl about that. She got someone else to do it for her.

JAMES H. SCHMITZ
Illustrated by Kelly Freas

# GLORY DAY

## I

The last thing she remembered feeling was a horrid, raging, topsy-turvy confusion. Her mind seemed simultaneously ripped apart and squeezed to a pulp. She hadn't been able to begin to think. Then there'd been nothing.

Now there was something again. The confusion was gone. She found herself here, and thinking—

Lying on her back on some soft surface, dressed. There was light beyond her eyelids which she wasn't going to open just yet. The attack on Casmard's space yacht hadn't killed her, or injured her physically. What about the others?

Her mind screens opened cautiously.

Trigger was close by, probably in the same room, asleep. Sleeping comfortably. There were no immediate indications of Casmard, which wasn't surprising since she'd never tried to touch his mind before. She didn't start searching for him. If neither she nor Trigger had been harmed in the attack on the yacht, he should be all right, too, at the moment.

But there'd been a fourth person on the yacht—a man named Kewen, Casmard's navigator in the Husna Regatta. Telzey did want to know immediately about him.

She put out search thoughts designed to awaken a response in the subconscious levels of Kewen's mind if they touched it. Eventually, one of them did. Telzey followed it up, eased herself very gently into that mind. Kewen also was placidly asleep. She studied his mental patterns carefully for a time, secured a number of controls on them. Before she was done, she was picking up occasional washes of faint thought from other sources. There were minds of psi type about, apparently unscreened, apparently nontelepathic.

That should be significant; in any case, it could produce immediate information. Finished with Kewen, Telzey waited for the next wisp of other-thought, touched it when it came, blended awareness with it, moved toward an unguarded psi mind and ghosted inquiringly around there.

She gained information—and what she learned increased her caution. She withdrew from the psi as imperceptibly as she'd approached.

Then at last, almost an hour after



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she'd first come awake, she opened her eyes.

There was diffused light glow on the ceiling, barely required here. Daylight coming through a large shuttered window on the right made a pattern of bright lines on the carpet. She was lying on a couch, and Trigger lay on a couch across the room from her, red-bronze hair spilling over her face. They were dressed in the clothes they'd worn on Casmard's yacht before the attack. Arranged along the floor in the center of the room was the luggage they'd had on the yacht.

Telzey gave Trigger's half-shielded mind a nudge, and Trigger woke up. She'd been close to awaking for some while. She lifted her head, looked over at Telzey, came up on an elbow and looked around. Her glance held on the row of luggage. She sat up, put a cautioning finger to her lips, got off the couch and went over to the luggage. She opened one of the suitcases.

Telzey joined her there. Trigger was unsealing a secret compartment in the suitcase. She brought out a cosmetics purse which she set aside, then a small bag which she opened. There were a number of rings in it. Trigger selected two, gave one to Telzey, put the other on her finger, returned the bag to the compartment, and closed that and the suitcase.

She put the cosmetics purse in her jacket pocket and watched Telzey very carefully fit on the second ring.

"That on-and-off husband of mine," Trigger said then in a normal voice, "is a security gadget nut. He insists I carry what he calls the minimum line around with me when we're not together. Every so often it turns out to be a good idea. We're distorted and scrambled now, so I guess we can talk. What's happened?"

"I've found out a few things," Telzey said. "Better get your O.G. shield closed tight, and keep it tight."

"Done," said Trigger. "Psi stuff around, eh?"

Telzey nodded. "Quite a lot of it! I don't know what that means yet, but it could mean trouble. About what happened to us—somebody seems to have turned a stun beam on the yacht and knocked us out before they grappled and boarded."

"A rough beam that was!" Trigger said.

"What did it feel like to you?"

"Well . . . let's say as if my head turned into a drum half the size of the universe and somebody was pounding on it with clubs. But I'm all right now. Do you know who did it, where we are, and what's happened to the Askab and the navigator?"

"More or less, I do," Telzey said. "We're on Askanam, in the Balak of Tamandun—Casmard's balak. More specifically, we're in a section of a palace which belongs to the man who's been Regent of Tamandun in Casmard's absence. He was presum-



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ably responsible for the attack on the yacht.

"To have Casmard kidnapped?"

"Apparently. I'm pretty sure Casmard's somewhere in the palace, and I know Kewen is. We're here because we happened to be on the yacht with Casmard."

Trigger said, after a moment, "From what I've heard of Askanam politics, that doesn't look too good."

"I'm afraid it isn't good," Telzey agreed. "When we're missed, all anyone will know is that Casmard's yacht appears to have vanished in interstellar space with all aboard."

"How does the psi business fit in?"

"I don't know yet. There're a number of psis of assorted types not very far from us. Anywhere up to two dozen of them. One had an unguarded mind and I tapped it. But I discovered then that some of the others were screened telepaths. I could have been detected at any moment, so I pulled out before I got as much information as I wanted. I'm not sure why they're here. There was something about a Glory Day—a big annual holiday in Tamandun—coming up. Something else about arena games connected with Glory Day festivities." Telzey shook her head. "Those psis aren't Askanam people. At least, the one I was tapping isn't. She's a Federation citizen."

"They might be helpful then," Trigger suggested.

"They might. But I'd want to find out more about them before I let them know I'm also a Federation psi who's probably in a jam. And I'll have to be careful about that because of the telepaths."

Trigger nodded. "Sounds like you're right! You'd better stay our secret weapon for a while. Particularly—are the psis in the building, too?"

"No, I'm sure they're not in the building. They're close to us, but not that close."

"But there's a connection between them and Casmard's Regent?"

"I'm *almost* sure of that."

"Well—" Trigger shrugged. "Let's freshen up and change our clothes before we have visitors. What do you wear on Askanam in the palace of a Regent who might be thinking of featuring you in the upcoming arena games?"

"Something quietly conservative, I suppose," Telzey said.

"All right. Just so it goes with my purse." The cosmetics purse didn't contain cosmetics but Trigger's favorite gun, and was equipped with an instant ejection mechanism. Conceivably, it could act as their other secret weapon here. "The door on the left looks like it should open on a refresher—"

## II

In certain confidential Overgovernment files, Askanam was listed among the Hub's experimental worlds. Officially, it was a world which retained a number of unusual privileges in return for acknowledg-



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ing the Federation's basic authority and accepting a few balancing restrictions. Most of its surface was taken up by the balaks of the ruling Askabs, ranging in size from something not much larger than a township to great states with teeming populations. It was a colorful world of pomp and splendor, romance, violence, superstition and individualism. The traditionally warlike activities of the Askabs were limited by Federation regulations, which kept Askanam pretty much as it was, though individual balaks not infrequently changed hands. Otherwise Federation law didn't extend to the balaks. Hub citizens applying for entry were advised that they were going into areas where they would receive no Federation protection.

Telzey was aware that the arrangement served several purposes for the Overgovernment. Askanam was populated largely by people who liked that kind of life, since nothing prevented them from leaving. They were attracted to it, in fact, from all over the Hub. Since they were a kind of people whose romantic notions could cause problems otherwise, the Overgovernment was glad to see them there. Askanam was one of its laboratories, and its population's ways were more closely studied than they knew.

For individuals, of course, that romantic setup could turn into a dangerous trap.

Telzey discovered an intercom while Trigger was freshening up, and after they were dressed again, they used it. They were connected with someone who said he was the Regent Toru's secretary, extended the Regent's welcome to the Askab Casmard's yacht guests, trusted they were well rested, and inquired whether they would be pleased to join the Askab and his cousin for breakfast.

They would, and were guided through a wing of the palace to a room where a table was set for four. The Askab Perial Casmard waited there, smiling and, to all appearances, at ease. Three other men were with him, and he introduced them. The Regent Toru, tall, bony and dark. Lord Ormota, with a bristling red beard, Servant of the Stone. Finally a young, strongly built man with a boyishly handsome face, who was Lord Vallain.

The Regent said, "I waited only to meet you and to express my regrets if any inconvenience has been caused you. I hope your visit to the Balak of Tamandun will be very pleasant otherwise. Political considerations made it necessary to bring you here, as the Askab will explain." He added to Casmard, "Your taste in guests is impeccable, dear cousin!" Then he bowed to Telzey and Trigger and left the room, accompanied by Lord Ormota.

They took their seats, and breakfast was served. When the waiters had left, Casmard said, "I regret deeply that you two are involved in this matter! We can speak freely, by



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the way. I'm using a distorter, and Toru, in any case, would have no interest in what we have to say. He's certain there's nothing we can do."

"Is it a very bad situation?" Trigger asked.

"Yes, quite bad!" Casmard hesitated, then shook his head. "I would be both insulting you and treating you unfairly by offering you false reassurances. The fact is then that Toru undoubtedly intends to have all four of us killed. He believes you're my women and that he can put additional pressure on me because of it."

"Pressure to do what?" asked Telzey.

"To renounce my right to the title of Askab of Tamandun, abdicate publicly in his favor. The reasoning is that my interests are no longer here. That's perfectly true, of course. It's been eight years since I last set foot on Askanam. For more than half my life, I've been a Federation citizen in all but legal fact. I've built up a personal fortune which makes me independent of the revenues of Tamandun. To act as the Balak's Askab in practice is something I'd find dull, indeed!"

Trigger said, "Then why not simply abdicate?"

"For two reasons," Casmard told her. "One is that, while I've intended to do it for some time, I also intended to wait another year and then make Vallain, who is my cousin as is Toru, my successor. He would have been of suitable age to become Askab then. He doesn't share my dislike for the role, and, as Askabs go, he would make a far better ruler for Tamandun than Toru. I still feel some slight responsibility toward the Balak."

"Which is why I've joined you on Toru's death list," Vallain informed Telzey and Trigger. He didn't appear greatly disturbed by the fact. "Very many people would prefer me to the Regent."

"Well, and there you have my second reason," Casmard went on. "After my formal abdication has been obtained and announced and Toru has himself installed as Askab, he'll lose no time in terminating my existence. If any of you are still alive at that time, you'll die with me."

Trigger cleared her throat. "You mean he might kill us first?"

Perial Casmard looked distressed. "Unfortunately, that's quite possible. You three are in more immediate danger than I am. Since I've never given evidence of the bloodthirstiness which is supposed to distinguish a proper Askab, Toru feels that fear is a tool which can be used to influence me. He may decide to make object lessons of you."

"Casmard," said Vallain, "what difference does it really make? We can't get off the palace grounds. We can't get out a message. We're not even being watched. The Regent is so sure of us that he can afford to treat us as guests until we die. He'll become the Askab of Tamandun on



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Glory Day, and none of us will survive that day. Since it's inevitable, don't let it upset you."

"When's Glory Day?" Telzey asked.

Vallain looked at her. "Why, tomorrow! I thought you knew."

Telzey pushed her chair back, stood up.

"Trigger and I saw some beautiful gardens from a window on our way here," she said. "Since the Regent doesn't seem to mind, I think we'll walk around there and admire them a while." She smiled. "My appetite might be better a little later!"

Casmard said uneasily, "I believe you would be safer if you stayed with me."

"How much safer?" Telzey said.

Vallain laughed. "She's right, Cousin! Let them go. The gardens are beautiful, and so is the morning. Let them enjoy the time they have left." He added to Telzey and Trigger, "I would ask your permission to accompany you, but in view of the situation, there are some matters I should take care of. However, I'll show you down to the gardens."

Casmard stood up.

"Then be so good as to wait for them here a few minutes," he told Vallain. "There's something I'd like them to have."

He led the way from the room, turned presently into another one and shut the door after Telzey and Trigger had entered.

"All things may be the tools of politics," he remarked. "On Askanam, the superstitions of the people are a tool in general use by those who seek or hold power—and they themselves often aren't free of superstition. When I was a child, my father, the Askab, made me promise to keep certain small talismans he'd had our court adept fashion for me on my person at all times. They were to protect me from tricks of wizardry. I've kept them as souvenirs throughout the years—and now I want to give one to each of you, for somewhat the same reason my father had."

He took two star-shaped splinters of jewelry no larger than his thumb nail from a pocket, gave one to Telzey and the other to Trigger.

"Well, thanks very much, Casmard!" Trigger said. "They're certainly very beautiful!" She hesitated. "Do you—"

Casmard said, "You're thinking, of course, that the danger we're in is affecting my mind. However, I can assure you from personal knowledge that superstitions, on occasion, may cloak something quite real. I'm not speaking of technological fakery, which is much employed here. You've heard of psis, of course. Sophisticated people in the Federation tend to believe that the various stories told about them are again mainly superstition. But having made a study of the subject, I've concluded that many of those stories have a foundation in fact. My parents' court adept, for example, while he professed to deal in magic and to



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control supernatural entities, evidently was a psi. And I'm sure that a considerable number of psis are active on Askanam to an extent they couldn't be elsewhere. The general belief in sorcery covers their activities—is simply reinforced by them.

"I don't know whether Toru has an adept working for him at present. But it's possible. It's also possible that he feels it would be an effective move to have you two appear to be the victims of sorcery. Frankly, I have no way of knowing whether the talismans actually offer protection against psi forces—but, at least, they can do you no harm. So will you keep them on your persons as a favor to me? I feel we should take every possible precaution available at present."

He left them at the door to the breakfast room, and Vallain showed them the way down to the gardens and told them how to find him, or Casmard, later when they felt like it. A number of other buildings were visible on the palace grounds, and Telzey asked a few questions about them. Then Vallain excused himself pleasantly and went away.

"If I were Toru," Trigger remarked as they started off along a path, "I wouldn't trust our Lord Vallain without a guard!"

Telzey nodded. "He's planning something. That's why he didn't want us to be around this morning. I'm not sure about Perial Casmard either. He's really a tough character!"

"What are *you* planning?" Trigger asked.

"I want to locate that group of psis as soon as possible—they should be in one of the buildings on the grounds. If I can get close to them, I can start doing some precision scanning. It's not too likely they'd notice that. Until we know something about them, it's hard to figure out what we can do."

"The telepaths could spot you if you went to work directly on the Regent?"

"Well, they might. Especially with a number of them around. We don't know how the group would react to that." Telzey shook her head. "But Toru could be too tough a job anyway in the time we have left! He and that Servant of the Stone don't seem to have any illusions about Askanam adepts either—they've imported good solid Federation mind shields of a chemical type and are using them. We might get better results if I don't waste time trying to work through that stuff. At any rate, we have to find out how the psis fit in first."

"Do Casmard's talismans do anything?"

Telzey shrugged. "They could make someone who believes in them feel more secure, of course. But that's all they can do."

## III

The palace grounds were very extensive and beautifully tended—a



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varied succession of terraced gardens, large and small. There wasn't a human being in sight anywhere. They followed curving paths in and out of tree groves, around artificial lakes, up and down terrace stairs of polished and tinted stone. Trigger inquired presently, "Are you working?"

Telzey shook her head. "Just waiting for some indication from the psis at the moment. So far there hasn't been a sign. What did you want to talk about?"

"Two things," said Trigger. "I had a notion about aircars—but it seems to me now that aircars aren't permitted in the balaks."

"That's right. No sort of powered flight is," Telzey said. "They use gliders in some places, and I remember Casmard saying a few Askabs have tried importing a flying animal that's big enough to carry a man. They're not very manageable though."

Trigger nodded. "That kills the notion! I doubt gliders or flying animals would do us much good if we could find them. But then, you know—I'm wondering why no one else seems to be in the gardens at present!"

"I've wondered a little about that, too," Telzey acknowledged. She added, "Did you hear something a moment ago?"

Trigger glanced at her. "Just the general sort of creature sounds we've been hearing right along."

"This was a spitting noise."

Telzey broke off, and both of them came to a stop. They'd been approaching a stand of shade trees, and, about sixty feet away, an animal suddenly had come out from the trees on the path they were following.

It stood staring at them. It was a short-legged animal some twelve feet long, tawny on top and white below, with a snaky neck and sharp snout. The alert eyes were bright green. It was a beautiful creature and an extremely efficient-looking one.

Trigger said very softly, "It may not be dangerous, but we'd better not count on that! If we move slowly off to the left, away from it—"

The animal bared large white teeth and made the spitting noise Telzey had heard. This time it was quite audible. Then, in an instant, it was coming straight at them. It moved with amazing speed, short legs hurling it along the path like a projectile, head held high above the body. Trigger slapped the side of the cosmetics purse at her belt, and the gun it concealed seemed to leap simultaneously into her hand. She turned sideways, right arm stretched straight out.

The animal made a blaring sound as the green eyes vanished in momentary scarlet flashes of light. The long body knotted and twisted, rolled off the path. The sound ended abruptly. The animal went limp. Trigger lowered the gun, stood watching it a few seconds.



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"Five head shots!" she said quietly then. "That's a tough creature, Telzey! Any idea what it is?"

"Probably something they use in arenas." Telzey's breath was unsteady. "It certainly wasn't a garden pet!"

"No. And I suppose," Trigger said, "somebody was watching to see what would happen, and is still watching. We pretend we think it was an accident, eh?"

"We might as well. It wouldn't do much good to complain. . . . They know about your gun now."

"Yes, that's too bad! It couldn't be helped."

They walked closer to the creature. From fifteen feet away, Trigger put another bolt into the center of its body. It didn't stir. They went up to it, looked at the blood-stained great teeth.

"At a guess," Trigger said, "the Regent wanted a couple of mangled bodies to shock Casmard with. Let's see if we can find out where it came from."

They followed the path in among the trees. A metal box stood there, open at one end, large enough to have contained the animal. There was no one in sight.

"They brought it up in a car and let it out when we were close enough," Telzey said. "If it had done the job, they would have knocked it out with stun guns and taken it away again. So it was Toru."

"You were thinking it might have been the psis?"

"It might have been. But if they were controlling it, it would have been moving about under its own power. And they—"

"What's *that?*" The gun was in Trigger's hand again.

"Psi stuff," Telzey said after a moment. "Don't do anything—it can't hurt us!"

Long green tentacles had lifted abruptly out of the earth, enclosing them and the metal box in a writhing ring. The tentacles looked material enough, and there were slapping, slithering sounds when they touched one another.

There came another sound. It might have been a sighing of the air, a stirring in the treetops above them. At the same time, it seemed to be a voice.

"Don't move!" it seemed to be saying. "Don't move at all! Stay exactly where you are until Dovari tells you what to do . . ."

Trigger moistened her lips. "All illusions, eh?"

"Uh-huh—illusions."

Someone knew they were here and was manipulating the visual and auditory centers of their brains. Very deftly, too! Telzey held her attention on the thought projections, drifted with them, reached the projecting mind.

Unscreened, unprotected mind, concentrated on what it was doing, expecting no trouble. She reflected, sent a measured jolt through it. Its awareness abruptly went dim; the illusions were gone.



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Trigger was looking at her. "What did you do?"

"Knocked out the sender for a little while."

"And now?"

"I don't know. The psis have discovered us and are taking an interest in us. I've let them know I'm a psi who doesn't want to play games, but I didn't do their illusionist any real harm when I could have done it. Let's go on the way we were going. We'll see what they try next. Better keep that shield good and tight!"

"It's tight as it can get," Trigger assured her. She had no developed psi talents; but she'd been equipped by a psi mind with a shield which was flatly impenetrable when she wanted it that way. They seemed adequately covered for the moment.

They continued along the path they'd been following. Trigger remained silent, watching the area about them, hand never far from the gun purse. Another sudden onslaught by a loosed arena killer didn't seem too likely; but the palace grounds almost might have been designed to let danger lurk about unseen.

Telzey said presently, "They're probing at us now! Carefully, so far, but I'm picking up a few things."

She, too, was being careful. There were at least half a dozen screened telepathic minds involved here—perhaps a few more. They seemed experienced and skilled. The best they weren't, Telzey thought; they shouldn't have been quite so readily detectable— though it was possible, of course, that they didn't much care whether she detected them or not. There was one psi mind around, at any rate, from which she could catch no thought flickering at all, but only the faintest suggestion of a tight shield with a watchful awareness behind it, unnoticeable if she hadn't been fully alert for just such suggestions.

That mind seemed highly capable. She concentrated on it, ignoring the others more or less at the moment, prowled lightly about the shielding. Then, for an instant, she caught an impression of the personality it concealed. Her eyes flickered in surprise. *That* personality was no stranger! Here—on Askanam? But she knew she hadn't been mistaken.

She directed a thought at the shield, self-identification accompanying it. "Sams! Sams Larking!"

A moment's startled pause, then:

"Telzey! *You're* the one old Toru was trying to do in?"

"That's what it looks like!" She gave him a mental picture of the short-legged animal. Quick thought flow returned. Confirmation—a short while ago, on the Regent's orders, a cheola from the arena pens had been transported to the palace grounds. One of the telepaths had been curious to see what Toru intended with the dangerous creature, and entered the mind of the vehicle's driver. When he reported that the cheola apparently had been killed by



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its intended victims, the group became interested.

"At that point, we didn't know there was a psi involved," Sams concluded. "Come on over and see us! They all want to meet you."

Telzey hesitated. The probing attempts of the others had stopped meanwhile. "Where are you?"

"You've been moving in the right direction. When you come into the open again, it's the building ahead and to your left. The Old Palace. We're the only ones quartered here at present. I'll meet you at the door. Toru doesn't have any other surprises prepared for you in the gardens, by the way. We've been checking, and will cover for you."

"All right."

Thought contact broke off. Telzey told Trigger what had happened. Trigger studied her face. "You don't seem delighted," she observed. "Isn't your acquaintance going to help us?"

"Well . . . I'm not at all sure! It might depend on why he and the others are here. Sams tends to look out for his own interests first."

"I see. So we stay on our toes and keep shields tight. . . ."

"I think we'd better."

## IV

"I've been arranging this for a year," Sams Larking said. "Toru is stingy, but he knows he has to come up with the best in arena games on Glory Day—particularly on the Glory Day he plans to be announced as Tamandun's new Askab to the multitudes. I offered him the best the Hub could provide at a price that delighted his shriveled soul. We've brought in the greatest consignment of fighters and performers, human and animal, in Tamandun's history! Hatzel"—he nodded at a chunky man with a round expressionless face on the other side of the big room—"will be sitting in the Regent's box with Toru, as Lord of the Games tomorrow. We've arranged the whole show. Toru keeps purring over the schedule. He feels he'll be the envy of Askanam."

Trigger said, "From what I've heard, more than half of the people you brought in for the arena should be dead before the games are over."

"Considerably less than half in this case," Sams told her. "We picked the best, as I mentioned. Local fighters aren't in their class!" He studied her a moment. "You disapprove? They all know the odds. They also know that the ones who survive the games will be heroes in Tamandun—wealthy heroes. Some will have a good chance of making it to the nobility. They know that more than one Askanam arena favorite wound up among the Askabs. They're playing for high stakes. I feel that's their business."

Telzey glanced around the room. Eighteen in all, half of them telepaths, the others an assortment of talents. In effective potential among nonpsis it was an army. Dovari, the illusionist, had regained con-



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sciousness before they reached the building. She was a slender woman with a beautiful and, at present, thoroughly sullen face.

"What are you people playing for?" Telzey asked. "You can hardly be making a profit on your deal with the Regent."

Sams shook his head. "That's not what we're after. You've heard of the Stone of Wirolla?"

Telzey nodded. "Casmard's mentioned it. Some old war relic with supposedly magical qualities. They used to sacrifice people to it by cutting out their hearts."

"The Regent's revived that practice," Sams said. "It's a form of execution now, reserved for criminals of note and for special occasions. The Stone then indicates its satisfaction with both offering and occasion through supernatural manifestations in the Grand Arena. The manifestations have been on the feeble side—Toru's too miserly to have had equipment for anything really spectacular installed. But it's traditional. The people love it."

"And?" Telzey said.

"This Glory Day, the manifestations *will* be spectacular. We have the talent for it assembled in this room. I'm grateful you didn't do more than tap Dovari because she'll be responsible for much of it. But we aren't confining ourselves to illusions, by any means! It's going to be a terrible shock to Toru when he sees his miracle gadgets producing effects he knows they can't possibly produce—all in honor of the new Askab, showing how highly the Stone of Wirolla approves of him! As it happens, that won't be Toru. At the end of Glory Day, *I'll* be Askab of Tamandun!"

He added, "And you see around you Tamandun's new top nobles—psi rulers of one of the wealthiest balaks of Askanam. You and Miss Argee are herewith invited to join their ranks! I've told the group of your ability, and they're ready to welcome you." He glanced at Dovari. "With the possible exception of our illusionist! However, she'll soon get over her irritation."

Telzey shook her head. "Sams, you're crazy!" She looked around the room. "All of you must be, to let him talk you into something like this!"

Sams didn't lose his smile. "What makes you say that?"

"The Psychology Service, for one thing. You start playing around with psi stuff openly, they'll be here to investigate. You don't think they'll let you use it to control Tamandun, do you?"

"As a matter of fact, I do," Sams told her. "I checked out our Askanam maneuver with them. Anything too obvious that could be attributed to psi is out, of course. But there's no objection to goings-on that in Tamandun will have the flavor of the supernatural and at more sophisticated levels will be passed off as superstitious gullibility. We'll have to



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keep to our balak, but, with those restrictions, what we do here is our business."

"If they're letting you do it," Telzey said, "they've been letting other psis do it."

He nodded. "Oh, they have. I said I've been preparing this for some time. I've been around Askanam and I know that plenty of psis have established themselves in the culture here and are operating about as freely as they like. But almost all of that's on a minor level. We'll be the first group that really gets things organized."

"You might have been the first to get shuffled out here as a group," Telzey said.

Sams's eyes narrowed slightly. "Meaning?"

"Isn't it obvious? The Federation exempts Askanam from normal restrictions because it's a simple way to keep a specific class of lunatics corralled. The experiment's worked out, so it's being continued. The Service evidently has expanded it to include irresponsible psi independents. Put them where whatever they do can't really add much to the general mess! I wouldn't feel flattered if they told me I could make Tamandun my playground but was to make sure I stayed there. What kind of playground is it? Being little gods among some of the silliest people in the Hub is going to bore you to death—or you're lunatics!"

"I have no liking," Dovari remarked, "for the girl's insults."

The man called Hatzel said, "There could be a difference of opinion about the opportunities waiting for us in Tamandun. But the point is, Sams, that you seem to be mistaken in believing Miss Amberdon would be interested in lending her talents to the group's goals."

"I still hope to be able to persuade her," Sams told him.

"Why not try it, Telzey? It may not be at all what you think. You can always pull out, of course, if you find you don't like the life."

"If I thought I might like it," Telzey said, "there'd still be the fact that Tamandun already has an Askab."

Hatzel said, "For the moment only. That's Toru's affair, not ours. As Lord of the Games, I'll be attending the Regent's ceremonial Glory Day dinner in the House of Wirolla tonight. So, I understand, will the Askab Casmard and his guests. Before the evening's over, Casmard will have abdicated formally. The vacancy will be filled at the end of Glory Day."

"Casmard's an old friend of my family," Telzey said. "If you're determined to set yourselves up in Tamandun, you could make an arrangement with him. He isn't much interested in remaining Askab. I'd see to it that he didn't remember afterwards there'd been psis involved in the matter."

Sams shook his head. "I'm afraid we can't do that. It's too late for it. We're prepared to deal with Toru and the Servant of the Stone tomor-



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row. The manifestations we've scheduled will make it easy to do and we'll have enthusiastic public approval. But it needs exact timing. We've made Toru's plans for Casmard part of our plan. If Casmard were still alive and still Askab on Glory Day, everything would have to be revised. At best, we'd wind up with something less effective."

"Aside from not interfering ourselves," Hatzel added, "we must also, of course, make sure that no one else does—in any way! And while we know Miss Amberdon's a telepath, it hasn't yet been established what Miss Argee's special abilities are."

"I have no special psi abilities," Trigger said shortly.

"Now that," one of the other men remarked, "is an interesting lie! I've been attempting to probe that young woman's shield since she entered the room. I can vouch for the fact that it's an extraordinary psi structure—unanalyzable and of extreme resistive power!"

Trigger shrugged. "Somebody else developed the shield for me. I couldn't have done it. Not that it makes any difference."

Sams smiled at her. "I agree! And I'm sure you both realize that we can't run the risk of letting you upset our plans. Once Glory Day's over, it doesn't matter what you do. We'll be glad to see you safely off Askanam then, assuming Toru's let you remain alive, which might seem rather doubtful if you won't join forces with us. Until that time, at any rate, you will have to allow the group to control what you say and do. It's really the only safe way, isn't it?"

"Forget it, Sams!" Telzey said. "Our screens stay tight."

"Will they?" Sams said mildly. "I don't like to put pressure on you, but we still have too much work to get done today to waste more time over this. . . ."

The room went quiet. Then a wave of heat washed over Telzey. It ebbed, returned, and intensified. Trigger gave her a quick, startled glance. Telzey shifted her shoulders.

"So you have a pyrotic with you!" she remarked.

Sams smiled. "We have several. Their range is excellent! Even if we allowed you to leave this room and building—though we won't—you couldn't get away from the effect. You don't want your blood to start boiling, do you? Or find your hair and clothes catching fire—as a start?"

Trigger, sweat beginning to run down her face, looked at Telzey. "Do you know who's doing it?"

Telzey nodded across the room.

"The tall thin man two seats left of Dovari."

Trigger's hand went to her cosmetics purse, and the gun made its abrupt appearance.

She said to the thin man, "I won't kill you if this doesn't stop immediately. But I'll stun you so solidly you won't have begun to come awake by the end of Glory Day!



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And it'll be two weeks after that before your nerves stop jumping."

The heat faded away. The group sat staring at Trigger. She jerked, made a choked sound of surprise, looked down at her hand. The gun had vanished from it.

Sams and a few of the others were laughing. Sams said, "Neat enough, Hatzel! Ladies, let's stop this nonsense. Since you can't win, why not give up gracefully? Telzey, you at least are aware you can both be killed in an instant as you're sitting there!"

Telzey nodded. "Oh, I do know that, Sams! But I haven't just been sitting here. I've found out Hatzel's shielded, and, of course, all you telepaths have your psi shields. But six of your most valuable people aren't shielded at all, and apparently couldn't operate if they were. Six psi minds—wide open! It would take an instant to kill us, and you can be quite sure that in that instant you'd lose those six! So I don't think you'll try it."

Sams stared at her. The others were silent a moment. Then one of the women said sharply, "Sams, she's bluffing! You said she's good, but between us all we certainly can block her as she strikes out. Then we can handle both of them as we wish."

Sams shook his head slowly. "I wouldn't care to count on it!"

Dovari said in a strained voice, "Nor I! And I don't want to die while you're finding out whether you can, or can't, block her. Let them go, Sams! If they try to interfere, you can still deal with them in some other manner."

## V

Trigger glanced back at the closed building door behind them. She looked both furious and relieved. "What do we do now?" she muttered.

"Keep walking," Telzey said. "Back to the Regent's palace. And we walk rather fast until we reach those trees ahead! I've still got my contacts back there. Some talk going on . . . Hatzel seems to be second in command to Sams. So he's a teleport—" She glanced at Trigger. "Too bad you lost your gun!"

"That's not all I lost."

"Eh?"

"My pants went with the gun."

"Well," Telzey said after a moment, "a minor demonstration, as Sams would say. A teleport at Hatzel's level is a very dangerous person. He didn't have to do that, of course. They were trying to make us feel helpless."

Trigger nodded. "And it worked just fine with me! I've never felt more helpless in my life." She looked over at Telzey. "Touch and go for a moment, wasn't it? I didn't think you were bluffing!"

"I wasn't. A bluff like that wouldn't have got past Sams."

"What makes them that kind of people?" Trigger said. "With everything they can do—"



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"That's partly it. Most of that group are bored psis. They've used their abilities to make things too easy for themselves. It's stupid but some do it. Now they've run out of fun and are looking for something new—almost anything that seems new."

They'd reached the trees, were hurrying along a path leading through the grove. Trigger checked suddenly, glanced down at the cosmetics purse. She slapped it. The gun popped into her hand.

"Well!" she said. "I felt the weight in the purse just now." She reached into the purse, pulled out a silky garment, shoved it into a pocket. "Briefs returned with the gun." She bit her lip. "Perhaps I should feel grateful. Somehow I don't!"

"Come on!" Telzey turned away, broke into a trot. "They did that to show you your gun doesn't impress them at all. But now you have it back, you might get a chance to express your lack of appreciation to Hatzel! We'll have to hurry!"

"What do you mean?"

"Can you set it to stun somebody for just a short time—a few minutes?"

"That's a bit tricky, but, yes, I can. Five minutes, say."

"Fine. Hatzel's been called to the palace to talk to the Regent. He'll be coming through the gardens on a scooter. If we get far enough ahead, we may be able to spot him and cut him off."

"All right. And I stun him. Then?"

"That's no telepath's shield he's using. It's a gadget. And if the gadget's the kind I think it is, I can open it and get to his mind before he comes around. Sams or somebody might realize what's happening, of course. That's a risk we'd better take! The quicker we get it over with, the less likely we are to be noticed."

They crouched presently at the edge of a terrace, winded and hot from the run, shrubbery about them. "He might still turn off on another route," Telzey remarked. "But it looks like he'll be coming by here now, doesn't it?"

Trigger nodded. "Seems to be heading this way!"

"That break in the bushes is the place to take him. How far will we have to work down to it?"

"We won't. Right here is fine. He's just chugging along."

"That's a good fifty yards, Trigger!" Telzey said doubtfully.

"And I'm a good fifty yards marksman. Some day I'll have to teach you how to use a gun."

"Perhaps you should. I never warmed up to guns. When I've had to use one, I just blasted away."

"What are your contacts doing?"

"Back to rehearsing their Glory Day surprises. They're not thinking about us at the moment. Sams might be, now and then. It's hard to be sure about him. But we should be able to get away with this."

Hatzel's scooter came chugging up shortly. Trigger touched the gun's firing stud, and Hatzel was sagging



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sideways off the scooter as the machine went out of sight behind bushes again. They worked their way hurriedly down to the path through the shrubs, found the scooter on its side, turning in slow circles. Trigger shut it off while Telzey went over to Hatzel who lay on his back a dozen yards away.

She knelt quickly beside him, lifted his head. Trigger joined her.

"Should be at the base of the skull, under a skin patch," Telzey said. "Here it is!"

She peeled off the tiny device, blinked absently at Hatzel's face. "Open psi mind—yes, I can do it." She was silent then.

Trigger glanced presently at her watch, said, "Four minutes plus gone, Telzey! He could start coming around any moment now. Shall I tap him again?"

"No, I've got him. He won't come around till I'm ready."

"I'll go plant the rock then," Trigger said.

She went a dozen yards back up the terrace where ornamental rockwork enclosed a flower bed, returned with a sizable rock which she placed on the path ten feet from where Hatzel was lying.

"*I'd* think it was a little peculiar I hadn't noticed that rock!" she observed. "But I suppose you're taking care of that?"

"Yes. He'll wake up with a small headache from having banged his skull. He'll see the rock lying there and be irritated, but that will explain it, and he won't want to tell anyone he wasn't looking where he was going." Telzey replaced the shield which wasn't operative at the moment, smoothed in the skin patch, stood up and brushed sand from her knees. "Finished! Let's move!"

They restarted the scooter, left it lying on its side, pushing itself awkwardly about in the grass, went quickly back up to the terrace and along it through the shrubbery, until they reached a grove of trees and came to another path.

Hatzel, still unconscious, reached into a pocket and switched his mind shield back on. He awoke then, sat up with a muttered curse, felt his head, looked around, saw the rock on the path and the struggling scooter in the grass. He nodded in annoyed comprehension, and got to his feet.

He couldn't be left unshielded because one of the telepaths would have been bound to notice it. Every five minutes, however, Hatzel now would switch the shield off for a moment, unaware of what he did. If there was reason to take him under active control, Telzey would make use of such a moment. They had a glimpse of him presently on the network of paths ahead of them, nearing the Regent's palace.

"Reacting just as he's supposed to, isn't he?" Trigger said.

Telzey nodded. "Uh-huh! It was a stupid accident, and that's all. He's got more important things to think about." She added, "I'd like to give



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Casmard some idea of what's going on, but there's no way I can keep them from looking into his mind or Vallain's, and anything we told him they'd soon know. We'll have to work out this side of it strictly by ourselves."

## VI

As they were approaching the palace entrance by which they'd left, a tall, splendidly uniformed man emerged from it and came toward them.

He introduced himself as Colonel Euran, head of the Regent's Palace Guard. "It's come to my attention," he said, "that you weren't informed of a security regulation requiring guests to surrender personal weapons for the period of their visit in the palace. I thought I should correct the oversight, to save you possible embarrassment. It's merely a formality, of course—but do you happen to have weapons in your room or on your persons?"

Since they'd known their encounter with the cheola had been observed, they weren't surprised. Trigger took the cosmetics purse from her belt and handed it to him.

"There's a Denton inside," she said. "Take good care of it, Colonel! It's an old friend."

He bowed. "Indeed, I will!"

Telzey said, "Could there be other regulations we don't know about?"

Colonel Euran smiled pleasantly. "It's no regulation. But the Regent Toru told me to suggest that you remain within the palace itself until he has the pleasure of meeting you again at dinner tonight. He's concerned about your safety."

"You mean the Regent's own gardens aren't safe?" Trigger asked.

"No, not always during the periods of arena games. There are subterranean levels here where beasts and criminals who've been condemned to the arena are kept. And it happens on occasion that some very dangerous creature eludes its keepers and appears unexpectedly in the palace grounds."

They thanked him for the warning, went inside. Following the directions given them by Vallain, they presently located the suite of Perial Casmard and announced themselves at the door. He opened it immediately.

"Come in! Come in!" he said, drawing them into the room and closing the door again. He looked at them, shook his head. "I'm very glad to see you," he said. "I wasn't at all sure you were still alive! Shortly after you'd left, Toru hinted in his pleasant manner that he had some particularly brutal end prepared for you! I went down to the gardens to find you, but no one could tell me where you'd gone."

They told him about the cheola. Telzey said, "We went on then and met some Federation people who've organized the Glory Day games for Toru this year. We thought we might be able to talk them into smuggling



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us out, but they weren't interested in getting involved in an intrigue against the Regent."

Casmard said he couldn't blame them too much. "If Toru found out about it, they might become more intimately involved in the games than any sensible man would wish to be!"

"And we're confined to the palace now," Trigger said.

"That's good—since it probably means that Toru is planning no further immediate steps against you. But the situation remains extremely difficult! Have you eaten?"

"Not since breakfast," Telzey said, "and we didn't eat much then. Now that you've mentioned it, I notice I'm very hungry."

Casmard had lunch for them brought to the suite. He watched pensively while they ate, said at last, "There was an explosion a while ago on the Regent's living level. Not badly timed—he'd entered the level shortly before the device went off. However, only one of his guard dogs was killed. Toru escaped injury."

They looked at him expectantly. He shrugged. "Vallain's now confined to his quarters. Toru rarely acts hastily. He'll wait for the pre-Glory Day dinner in the House of Wirolla tonight before pursuing the matter."

When they'd finished lunch, he said, "I'm reasonably certain the Regent also will hold his hand now as far as you two are concerned. However, it would be best if you went to your room and stayed there, so as to bring yourselves as little as possible to his attention."

Telzey said, "You still don't see how we can get out of this?"

"Oh, I'm not entirely at the end of my resources," Casmard told her. "I shall meet the Regent again during the afternoon and may be able to persuade him to accept less drastic arrangements than the one he has in mind."

They left to go to their apartment. Trigger inquired reflectively, "You had the impression Casmard wanted us out of the way?"

"Yes, he does want us out of the way," Telzey said.

Trigger glanced at her. "Picked up things over lunch, huh?"

"Yes. Something about an elderly character in the palace who used to act as poisoner for Casmard's mother, and seems to have kept his hand in. Casmard's promised him a high spot in the nobility if he can get to Toru before dinner, and the old boy's game to try it."

Trigger shook her head. "Life expectancies would be awkward to calculate around here! Does Casmard think it will work?"

"Not really. He's getting desperate. If he did get rid of Toru, there'd still be a serious problem with the Servant of the Stone—Lord Ormota."

"How does he fit in?"

"After Toru, he's apparently the most powerful man in Tamandun. If Toru died, he'd have a great deal



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more power here in the Regent's palace than Casmard and Vallain combined could bring up. So he'd probably simply become the next Askab, with no other change in the proceedings."

"The Stone he's the Servant of is presumably the Stone of Wirolla, where they cut out people's hearts?"

"Yes."

"And the House of Wirolla, where they'll be holding the ceremonial dinner we're supposed to attend– that's where the Stone is?"

"Yes," Telzey said. "I got that from Hatzel. Big black hall. The Regent's table stands right across from the Stone."

"Should be a great dinner party for ghouls!" Trigger said after a moment.

"Well, it all seems part of their local religion or whatever you want to call it."

In a closet of their room they found games, provided for the entertainment of guests. They were unfamiliar and looked complicated enough to be interesting. They set up one designed for two players. It was cover– Telzey would be mentally active on other levels.

Hatzel's shield had been opening regularly on schedule. She'd caught the opening a few times, checked him out briefly. There was nothing of interest there at present. She'd dropped her contacts with the unprotected minds in Sams's group. They had no immediate value.

She spent a little time hunting around for traces of the navigator of Casmard's space yacht, located him finally and told Trigger, "Kewen's not in the palace any more. He's been transferred to the place they keep the criminals they'll start feeding into the arena games tomorrow. That's what's scheduled for him."

Trigger looked startled. "Does he know it?"

"He knows, but I sort of tranquilized him this morning after I picked him up. It isn't bothering him."

"It bothers me," Trigger said. "Of course, he might last longer than the rest of us, at that."

"Yes. And if we get out of it, we should be able to get him out."

A palace courier had announced himself discreetly at the door half an hour after they'd returned to their room, and handed them a formal invitation from the Regent. They would be sitting at his table during dinner in the House of Wirolla that night.

Telzey spent the remaining hours scanning the minds in the palace and its vicinity. There were many she could have entered without much trouble, but finding minds that would be useful in the present situation was more difficult. Colonel Euran of the Palace Guard had been a primary target but turned out to be as thoroughly mind-shielded as the Regent and the Servant of the Stone. Telzey wasn't too disappointed. Toru hardly would want someone in that position to be subject to hostile psychic influences.



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She developed some selected contacts presently. There were others she would have preferred, but they couldn't be made available to her quickly enough.

Then it was time to prepare themselves to be taken to the House of Wirolla. It was one of the buildings on the Palace grounds, serving both as a personal palace for the Servant and as a temple for the Stone.

## VII

The ceremonial hall in the House of Wirolla lived up to Trigger's expectation that it might have made a good place for the festivities of ghouls. Walls, ceiling and floor were of black stone. On the lower level, the only light was provided by torches flaring sullenly from the walls and along the tables, where the top rank of Tamandun's nobility and dignitaries dined tonight. It was separated from the upper level by a flight of low stairs, running the width of the hall.

On the upper level, there was light. The curved table of the Regent stood there by itself, the Regent's honor guests seated along the outer edge of the curve. The arrangement provided them with a good view of the Stone of Wirolla on the far side of the hall. The Stone was huge and seemed almost formless, while somehow suggesting a hunkered shape which could have been human as much as Wirollan. It was gray-green, and there was an indication of scales over parts of its surface. A thick hollowed projection near the lower end might represent a pair of cupped and waiting hands. Supposedly, the Stone had been in the Hub for some centuries, having been found on the destroyed flagship of a Wirollan war fleet. But the early part of its history was uncertain.

Nowadays, at any rate, it represented a deity, or demon, who periodically indicated an appetite for human sacrifices. Traditionally, it should indicate that appetite tonight. The circumstances didn't make for light-hearted dinner conversation, but most of those who sat along the curving table, Casmard and Vallain among them, hadn't seemed much affected. Hatzel, three seats from Telzey, ate in stolid silence. From the lower level came an indistinct sound of voices. Glory Day music washed through the air, incongruously bright and brisk.

Weapons weren't allowed in the hall. But guns pointed through con-



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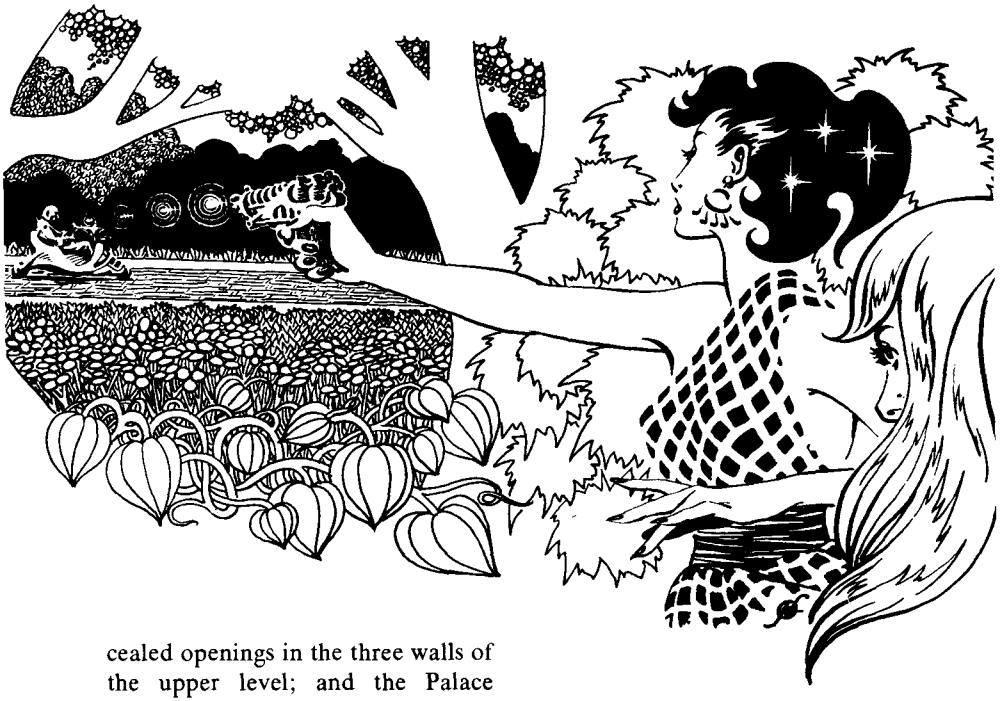

cealed openings in the three walls of the upper level; and the Palace Guards who held them had every section of both levels under observation in scanners.

Three of those Palace Guards and their guns were now Telzey's. The Regent's guard dog, a great arena hound standing twelve feet back of its master's chair, was nearly hers. It was, at any rate, no longer the Regent's.

It wasn't till dinner drew near its end that tensions began to be noticeable. At last, Telzey became aware of a faint tremor in the stone floor under her feet, in the chair on which she sat. It continued only a moment; but when it stopped, all talk had ended and the music had faded away.

Now the tremor returned, grew stronger, swelled into an earthquake shuddering. Again it lasted only a few seconds. By then, no one near Telzey was stirring. She found herself holding her breath, released it. A third time it came, accompanied by a distant roaring sound, suggesting a blurred giant voice. As that stopped, a low black table was rising out of the floor before the Stone of Wirolla. Two gray-clothed men, gray masks covering their faces, came out from behind the Stone on either side and stopped at the ends of the table, ropes held in their hands.

Lord Ormota, Servant of the Stone, got to his feet and strode out in front of the Regent's table. He raised his arms, and his amplified



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voice sounded deeply through the hall.

"The Stone of Wirolla will take two hearts tonight!"

Ormota paused, bearded face turned up in an attitude of listening. The roaring sound came again; the black hall shook, and grew still. Ormota turned toward the Regent.

"Two traitors to Tamandun sit with the Regent Toru tonight, believing themselves unknown! The Stone of Wirolla will point them out and receive their hearts."

Two traitors? Vallain, whose face had paled at last, must be one. The other? Telzey had seen in Casmard's mind that while his poisoner had found no opportunity to practice his arts on the Regent, he'd at least aroused no suspicions. But perhaps Casmard was mistaken in that. Or perhaps—

Telzey's thoughts broke off. Out of the hollowed projection on the Stone a black object like a cane or wand floated up into sight. It lifted swiftly into the air, impelled by a mechanism which Ormota presumably controlled. It hung quivering for a moment in the center of the upper level of the hall. Then, emitting a high singing note, it drifted down toward the Regent's table, swinging left and right like a compass needle. No one moved at the table; but there was an expectant stirring on the lower level, as diners shifted about to have a better view at the instant the Stone's device would indicate the night's sacrifices.

It came closer, still swinging back and forth along the curve of the table. Then, the singing note surging shrilly upward, it halted, pointed at Hatzel.

Telzey felt the shock of utter surprise in Hatzel's mind, saw for an instant a look of incredulous consternation on Ormota's face.

The wand vanished.

There was a crystal shattering against the face of the Stone. Black shards clattered down into the hollow below. The Regent Toru staggered half up out of his chair, eyes and mouth grotesquely distended, made a groaning sound and went over backward with the chair. Ormota clutched his chest, looked for a moment as if he were trying to scream, collapsed in turn.

One of the gray-clothed men uttered a high-pitched yell of horror. His shaking hand pointed at the hollowed projection of the Stone.

Two human hearts thumped and thudded bloodily about in it. A din of screaming arose in the black hall.

"Your Askab showed such extraordinary presence of mind in taking charge of the situation that I'm convinced you're controlling him!" Hatzel told Telzey and Trigger in hurried undertones. "However, that was, in fact, the best immediate way of handling this unexpected turn of events! Toru obviously intended treachery against our group. I had to make him and the Servant appear to be the Stone's intended sacrifices or



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allow myself to be butchered."

He added, "I'll have to let Larking know about this at once—but first I want to warn you. Your lives and those of Casmard and Vallain are no longer endangered, so be satisfied with that! Don't try to make use of what's happened to interfere with our plans. They remain essentially unchanged, though details must be modified now. Sams Larking, in other words, will still be the new Askab of Tamandun at the end of Glory Day. Casmard and you two will be seen to a Federation spaceport, and if you're wise you won't lose too much time then getting off the planet!"

A bleak smile touched his face.

"This should in fact improve our future position!" he remarked. "The discovery that Toru's and Ormota's bodies showed no outward sign of injury after the Stone had taken their hearts has made many new believers in the supernatural tonight!" He turned away, concluding, "Remember what I've told you!" and walked off.

They looked after him. Unaware that he was doing it, Hatzel reached into a pocket and switched his mind shield back on. It would stay on now.

Trigger said thoughtfully, "No way those telepaths can find out you had him point the Stone's wand or whatever it was at himself?"

"No," Telzey said. "I released my controls on him just a moment ago. Sams is naturally suspicious, but if he looks over Hatzel's mind, it will seem everything happened exactly as Hatzel thinks it did."

## VIII

The Glory Day games began. The Grand Arena's spectator sections were astir with rumors, curiosity, and interest. Word had spread of great and strange events in the House of Wirolla the night before—the Regent Toru and the Servant of the Stone had been revealed as traitors and slain by the Stone itself, and the long-absent Askab Perial Casmard again ruled Tamandun, supported unanimously by the nobility. The general expectation was that there would be omens and signs to make this year's Glory Day one to be long remembered.

Five sat in what previously had been the Regent's box—the Askab Casmard, Lord Vallain, Telzey, Trigger, and Hatzel, Lord of the Games. Casmard and Vallain were in an undisturbed state of mind. They were undisturbed because they knew that the occurrence in the House of Wirolla, horrifying—though very fortunate—as it had appeared at the time, had been the work of a friendly psi. They knew it because the friendly psi had told each of them so mentally; and they'd compared notes. They didn't know who the psi was and had been instructed not to try to find out. They wouldn't. Casmard intended to announce his abdication in favor of Lord Vallain at the end of the day's games—



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Sams Larking and his group were aware that Telzey was controlling Casmard and Vallain, but there was no reason for them to object. The two had needed support and guidance in a critical situation, and she was supporting and guiding them in a way which avoided problems for Sams. Hatzel, when he appeared in the arena box, had murmured to Telzey and Trigger, "Larking tells me you're cooperating nicely. That's fine! Let's be sure it stays that way!" He'd smiled gently at them. He had no doubt it would stay that way. He'd demonstrated his potential for instant deadlines, if there'd been any question about it. And one of Sams's telepaths was remaining in good enough contact with Casmard and Vallain to catch any suspicious maneuvers Telzey might attempt through them. If she attempted any, Hatzel would be informed at once and was to take whatever steps seemed required. The group was playing for keeps and had made the fact clear.

There was another mind on which Telzey was keeping tabs—that of the yacht navigator. Kewen had been released from the arena pens to which he'd been transferred; and it occurred to Casmard then that a fine seat at the Glory Day games should compensate the poor fellow in part for his unnerving experiences. He wasn't far from the Askab's box. One of the telepaths had checked him and found Kewen had been in a state of shock and was coming gradually out of it, held under calming control by Telzey.

As far as the psi group was concerned, that took care of Telzey. She'd been neutralized. She mightn't like what they were doing, but it didn't matter. They each had their work to handle now, playing out rehearsed roles in the ascending series of thrills and marvels which would wind up with Sams Larking being roared into office as the new Askab by the people of Tamandun.

The opening events of the games were brisk and colorful enough, but still tame stuff by Tamandun's standards—mere preludes to what the day should bring. The crowds watched in tolerant appreciation for the most part, details of the action being shown in enlarging screens above each arena section.

Then what seemed to be happening in the arena was no longer what was shown to be happening in the screens. Dovari's illusions were putting in an appearance. The spectators realized it gradually, grew still, fascinated—the Stone of Wirolla was manifesting in ways it hadn't manifested before! The illusions weren't disturbing in themselves. But uncanniness was touching that area of Tamandun.

Dovari was an excellent illusionist, Telzey thought. And now it seemed to be time. She gave Trigger the signal they'd agreed on. Trigger smiled in response, slipped a knockout pill into her mouth, swallowed it.



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Ten seconds later, a shock of fright jolted through Kewen's drowsy complacence. And Kewen responded. Telzey erased her shielding screens in that instant, brought all personal psi activity to an abrupt stop.

Hatzel, sitting behind Casmard, jerked violently, and disappeared. Trigger slumped limply back in her seat, eyes closed. The illusions in the arena whirled in a wild, chaotically ugly turmoil.

Shock waves of alarm could almost be sensed rising from the spectator sections. Perial Casmard calmly switched on the amplifying system before him. His calm voice spoke throughout the Grand Arena, telling his subjects that what they were witnessing wasn't merely another manifestation but one which, by its very violence, must be regarded as an augury of an approaching great period in Tamandun's history. . .

It was a rehearsed speech, but Casmard didn't know it. And it was effective. There was no general panic.

"There's one type of psi," Telzey had told Trigger some hours before, "no other psi wants to run into. They call him the howler. A howler has just one talent—he can kick up such a hurricane of psi static that the abilities of any other psis in his range fly out of control and start working every which way. That's pretty horrible for those psis, especially for the ones with plenty of equipment! The more they can do, the more's gone suddenly wrong—and the harder they try to hang on to control, the worse the matter gets!

"You and I got hit by a howler when Casmard's yacht was attacked. It was our navigator. Kewen didn't know he was doing it; he doesn't know he's a psi. But when he gets Frightened, he howls! It's an unconscious defensive reaction with him. He was frightened then—and your shield began to batter itself with psi energy instead of repelling it. You felt as if your head were being pounded with clubs. I can't really say how I felt! I went crazy instantly in several different ways. Fortunately, it was just a few seconds before the stun beam they used knocked us and Kewen out—"

This time, Kewen was going to stay frightened for something like three minutes. That, Telzey thought, certainly should be enough. Then his fears would shut off automatically. She'd arranged for that.

Trigger would be unconscious meanwhile, oblivious to the fact that her shield was drawing torrents of hammering energy on itself. While Telzey, awake and unshielded, would have divorced herself from anything remotely resembling an ability to handle psi until the howler had gone out of action again.

## IX

Some four hours after the official conclusion of Glory Day in Tamandun, Telzey and Trigger were sitting



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in a lounge of an Orado-bound liner. Sams Larking walked in, glanced around and came over to their table.

"Why, hello, Sams!" Telzey said. "We didn't know you were aboard."

"I know you didn't," Sams said. His eyes seemed slightly glazed. He sat down, ordered a drink through the table speaker, sighed and leaned back in his chair.

"To tell you the truth, I'm not in the best of condition," he said. "But I didn't feel I needed to be hospitalized. I came on just before takeoff, rather expecting to find you around somewhere."

"How are the rest of them doing?" Telzey asked. It had taken a while to locate the members of Sams's group individually and get them under sedation; but they'd all been rounded up at last and transferred to the Federation's base hospital on Askanam.

Sams shrugged. "They're not well people, but they'll recover. They're shipping out on a hospital boat tomorrow. None of them felt like hanging around Askanam any longer than they had to." He shook his head. "So you ran in a psi howler on us!"

Telzey lifted her eyebrows. "I did?"

"Since you two are in fine shape, yes. There aren't that many howlers around. It wasn't a coincidence that brought one to the Grand Arena, and set him off just as we were going into action. How long did he go on blasting?"

"Three minutes, more or less."

"It seemed a lifetime," Sams said darkly. "A hideous, insane lifetime!" His drink came; he emptied it, reordered. "Ah, now!" he said. "That's a little better! It was rougher on the special talents, you know. Dovari was still running waking nightmares when I left—and those are pretty badly singed pyrotics!"

"Hatzel and the other teleport should have got only a touch," Telzey said.

Sams nodded. "And that's what shook them up so completely. Only a touch— and Hatzel found he'd flipped himself halfway around Askanam! The other one didn't go quite that far, of course; but neither had done that kind of thing before, and neither wants to do it again. They can't remember *how* they did it. And they keep thinking of the various gruesome things that can happen to a teleport at the end of a blind flip—those two are very, very scared."

His second drink came. He took a swallow, set it down, smacked his lips. "Beginning to feel more like myself!" He gave them a brief grin.

Trigger said, "Are you going to try any more operations on Askanam?"

Sams shook his head.

"Too much bother. I'd have to build up a new gang. Besides, I decided Telzey was right—I'd get bored to death in a year playing games like that. Who's Askab in Tamandun now, by the way?"

"Vallain," Telzey said. "Casmard abdicated publicly in his favor at the end of Glory Day. A popular deci-



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sion, apparently! Casmard doesn't intend to go back to Askanam again either."

"He's on board?"

"Uh-huh."

Trigger said, "He was telling us in confidence a short while ago that he and Vallain had personal proof there'd been a mysterious but well-intentioned psi involved in the downfall of Toru and Ormota and the various other strange Glory Day events. He said it was something that shouldn't discussed, at the psi's special request."

"Well, there's been no significant breach of secrecy then," Sams said. "The Service might have got stuffy on that point!" He reflected, grinned. "I was sure Toru and Ormota would be taken out one way or another after you two ambushed Hatzel in the gardens!"

"You knew about that, eh?" Telzey said.

"Knowing you," said Sams, "I didn't expect you to pass up any opportunities. It wasn't a surprise."

"Why didn't you try to do something about it?"

He shrugged. "Oh, I figured I could spot you Hatzel and still win the game. And if you hadn't come up with the howler, I'd have done it."

Telzey smiled. "Perhaps you would, Sams—perhaps you would!"

## *in times to come*

*Next issue features a cover by Kelly Freas that might mislead you—we haven't gone into competition with* Field & Stream *even though the most prominent feature on the cover is a flight of ducks; the cover's title is "The Bird Takes Off," and the "bird" involved is Apollo 14 taking off from the Cape Kennedy Wildlife Reservation.*

*Analog had two representatives at the Cape for the Apollo 14 launch, Kelly Freas for pictorial coverage, and Gordon Dickson for text. Next month carries the conclusion of "The Outposter"; August will start "The Lion Game," by James H. Schmitz (in collaboration with Telzey Amberdon!) and naturally has to have a cover. Thus Kelly's painting fits best in this Part III issue; most of his black and white sketches will appear a little later with Gordie's article.*

*The lead story next month is Joseph P. Martino's "Zero Sum"—a yarn which, among other things, demonstrates why the very best Games Theory evaluations of a war situation aren't worth a damn—when dealing with an alien race with different basic ideas!* ■ THE EDITOR



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# *the swan song of Dame Horse*

Heroin, more than any other thing,
is the cause of the collapse
of our great cities.
But there might be a permanent cure!

TED THOMAS
Illustrated by Leo Summers

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Angie Grecca was a quick-thinking man who believed in planning ahead. When he made a buy, he made it well in advance. He wanted none of the urgency that drove the users who waited until the last minute. With his bags safely in his pocket he always had a steady hand. He could even bargain with the pusher and make his buys at a better price. Angie Grecca planned ahead, and that way he always had everything under control.

He glanced at his watch and knew it was almost time for a fix; he did it by the clock rather than by his loins. He yawned and walked up the stairs to his room and laid out his stuff. Angie Grecca was proud of the fact he made his own equipment. But unlike the equipment of the others, his was always sterile. No hepatitis, or tetanus, for Angie Grecca, no abcesses on the arm. He carefully selected a well-boiled needle and an eyedropper, being careful not to touch them where it mattered. He assembled them with the sterile rubber components, and laid the outfit down on a Kleenex. He emptied the contents of a bag into the bowl of the spoon and added a bit of sterile water. He watched the horse dissolve as he warmed the mixture over his alcohol flame. His movements were slow and steady, another advantage of always planning ahead! Never wait until the hands begin to shake.

It took Angie Grecca ten minutes to get ready, and he loved every minute of it. He wrapped his belt around his upper left arm, twice, slipped the end through the buckle, and gripped the end between his teeth. With both hands free he drew the broth up into the eyedropper, tested its temperature with his finger, and slipped the needle into a distended vein. There were other marks on his arm, but they were all small and well healed; Angie Grecca used nothing but the sharpest needles.

He settled back in his chair, squeezed the rubber bulb a bit, and then drew some blood back up into the glass tube. He liked to delay it, play it a little. He waited for the feeling of gentle lassitude to begin. It did not, so he worked more fluid back and forth into the vein, and waited. Nothing happened. He sat up and shot it all in. There was no result.

Angie Grecca did not panic; he had another bag, and he immediately began to work on it. He moved more quickly, but carefully still, his thoughts on Vince Corda, the pusher who had sold him the horse, sold him a blank bag, all milk sugar. When Angie Grecca took the belt in his teeth this time, he bit down on it hard, thinking of Corda. Nobody ever played Angie Grecca for a sucker, and Corda was going to be one sorry slob.

Angie shot half the bag in one squeeze, waited for the feeling that did not come, and shot the rest. Nothing, and that was all he had. Angie took the time to rinse the equipment and wrap it in the cloth and drop it in a pocket. He went out



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and walked the two blocks to Washington Square and went in to Podlofski's Mod Shop and said, "I need a buy, Pod. Now." His voice was raspy.

Podlofski looked at him with a practiced eye and said, "You in bad shape Angie. I dunno that I can do anything for you. You see if—"

Angie managed a smile and said, "I got one pusher on my list right now, Pod, that just sold me a coupla blanks. He's gonna get his, quick. Don't make me add you to my list, so stop playing around. Now." He wiped away perspiration.

Podlofski dipped his head quickly and pulled a bag out from a pile of women's underwear beneath the counter. He handed it to Angie and said, "Ten dollars."

Angie's smile showed more teeth, but he handed over the ten and said, "I'll take the use of your john for a few minutes for that money." And he walked around the counter, pushed aside the protesting Podlofski, and went into the bathroom and laid out his paraphernalia. In a minute and a half he shot the bag. Nothing happened, and he slowly dropped his paraphernalia, one item at a time, into the wastebasket and went out to the front of the store. Podlofski started to say something, but Angie picked up a large incense burner and smashed it into his face. Podlofski crumpled to the floor, and Angie stood over him and said hoarsely, "I don't know what you guys are up to, but you don't pull none of it on Angie Grecca." Podlofski was unconscious.

His right triceps was twitching as Angie got out to the street. A block away he walked into the station and up to the desk sergeant and said, "My name is Angie Grecca and I got some trouble."

"Yeah, Angie. I see you do. We'll send you over to the hospital."

"Before you do, I wanta blow the whistle on a couple guys. Vince Corda, Podlofski. Pushers. I'll testify against them. You pick them up, I'll testify, anytime, anywhere. You understand? They cheated me. I'll testify."

The sergeant made notes, and another junkie walked in, perspiring, nose running, gasping. While he was blurting out his story, a third walked in. The sergeant sent them all over together in the same wagon, and when they were herded into Admissions they found six more junkies in more or less advanced stages of withdrawal symptoms. Even the police officers were astonished. "What the hell's going on? We got half the users in the Thirty-fourth Precinct here. Somebody send in a bad shipment?"

Angie heard him and began to wonder. The doctors were making quick checks and segregating them into groups and arranging for the guards to stand by. It was going to be a bad few days for everybody. Among the doctors was a little man in a jacket and baggy slacks. He looked very much out of place. Even through his increasing nausea Angie



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noticed him—funny little guy with a button of a nose, not old, kept his head tilted back as though he were looking down his nose, even though he didn't have one.

They took Angie to one side and the intern said to the nurse, "I want this one on methadone for a few days; he's going to testify." She nodded and quickly came back with the pill. Angie gratefully popped it down with a little water. His nausea grew. The intern nodded to the nurse, and she got another. Angie took it, waited a few moments, and threw up the water. He began to shiver, and his back hurt, and the stomach cramps came on. The intern, a puzzled look on his face, went over him again. When the hot flash came, Angie saw the little man with no nose watching him closely. The intern spoke quietly to the little man and sent for a hypo with something and shot it into the muscle on Angie's upper left arm. It did nothing, nothing at all. The little man spoke to the intern and left, and the intern watched Angie with wide eyes. Through his cramps and spasms Angie knew that in some way he was a special case.

The next four days were bad ones for Angie. His habit was one of long standing, and the spasms that wracked him, the diarrhea and vomiting, the chills and fever, the screaming need for horse made him wish he were dead. For four days he wished he were dead, although they kept telling him, "Stay with it, Angie. Nobody ever dies of heroin cold turkey in a hospital. Stay with it, boy. Another day or two."

When the worst was over the police took Angie's statement about Vince Corda and Podlofski. In another few days he was well enough to leave. He walked out the door and headed back to his flat, eight pounds lighter than when he went in. A block from his flat a car pulled up to the curb and a husky man in a tight suit and a cauliflower ear hustled him into the back seat. Another man waited in the back seat looking, acting and talking much like George Raft in the old movies.

He said, "Angie, I want to ask you. Why did you blow the whistle on Vince Corda and Podlofski? They were good boys, hard working. Now, why did you do that?"

Angie Grecca stood by his principles, and though his stomach crawled within him, he said defiantly, "They sold me bad goods, plain sugar, after I paid them good money, too. Nobody cheats Angie Grecca. Nobody."

The George Raft type said, "Angie, that ain't true, it just ain't true. I happen to . . ."

"Don't tell *me*. I shot three bags in the space of half an hour. I know sugar when I get it. It was nothing. Them guys is robbers."



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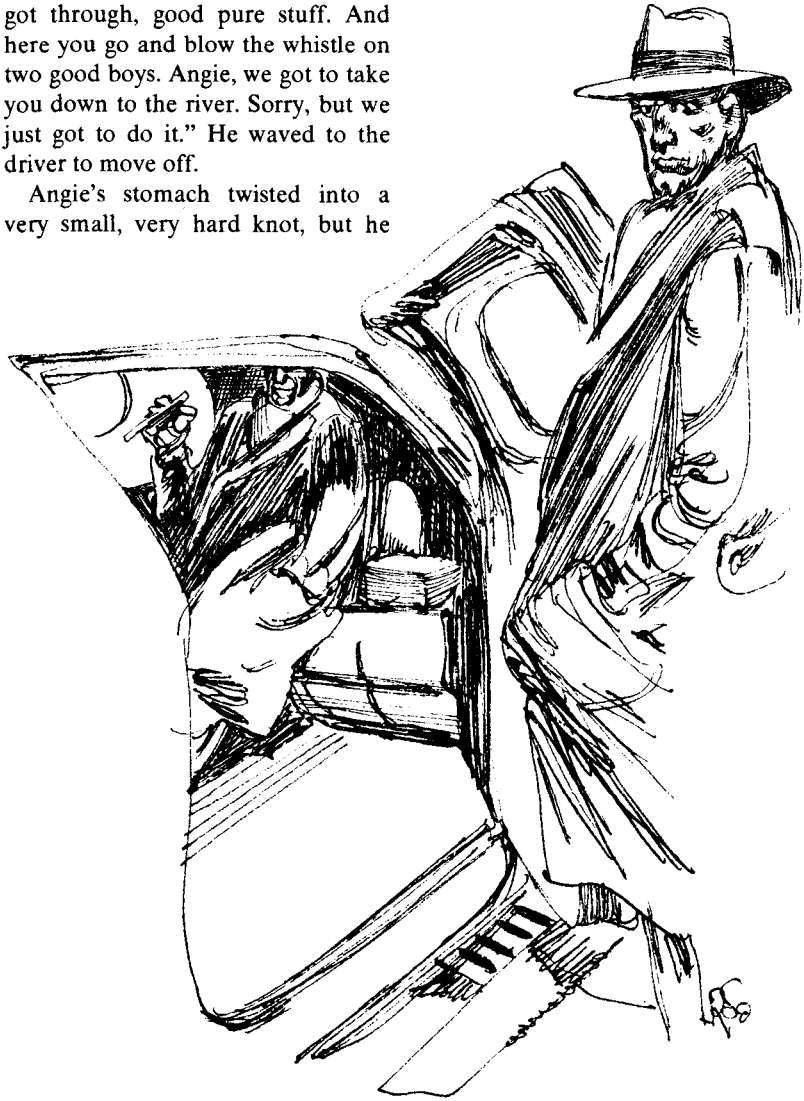
"I happen to know that shipment was better than anything we ever had. Biggest one we ever had, too. We was all surprised at how much got through, good pure stuff. And here you go and blow the whistle on two good boys. Angie, we got to take you down to the river. Sorry, but we just got to do it." He waved to the driver to move off.

Angie's stomach twisted into a very small, very hard knot, but he





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never lost his cool. He said, "You're making a mistake. That stuff was no good, I tell you." He had a thought. "How come all them other guys was in the hospital with me if that stuff was good? I never seen so many guys in cold turkey before." He caught a quick glance between George Raft and the triggerman, and knew he was on to something. "I saw something else funny at the hospital, too. I think you guys've been had by the Feds." He stopped talking.

George Raft waited a decent interval, then said, "What else did you see at the hospital, Angie?"

"I want out of here if I tell you. Now wait." The triggerman had turned toward him and had reached for his neck. "Wait. I'm telling you your stuff was no good. All the guys with the habit will tell you. Me being at the bottom of the river won't change that. You must a lost more than Corda and Podlofski. Now let's just talk about it like gentlemen, and forget about the river. O.K.?"

George Raft thought about it, and then waved the driver over to the side of the street. Angie could see the river two blocks away. When the car stopped Angie said, "There was a strange guy there at the hospital, little guy, about thirty-five, no nose, and he had Fed written all over him. He was watching us, giving orders to the docs. He knew what was going on all the time. You find that little guy and ask him a few things. He knows what's going on."

George Raft thought, a long time this time, then he said, "All right, Angie. We'll let you go this time, but I want you to find out who that little guy is and what he's doing. You do that, and you won't have to go to the river for now. But you blow this, and in you go."

"But I don't know nothing about these things. How am I gonna find out who he is, and all like that."

George Raft waved at the driver who put the car in gear, but Angie said, "Wait a minute, wait. All right. I'll do it." He began to think. "Look, this is going to be a big deal. I'm gonna have to hire me some private eyes, and like that. Where do I get the money?"

"I'll give you all you need. But Angie, you won't fool around none, will you? Because if you do, we'll find you, and when we get done with you you'll wish you had gone right to the river this morning. You understand, Angie?"

Angie nodded, and George Raft handed him a large roll of bills and said, "As of right now, Angie, you're working for me. You do good, and you'll be all right. You blow this—"

Angie nodded, and hopped out of the car, and walked back to the hospital. Might just as well get started right away. The intern said to him, "Didn't expect to see you back here so soon. You need detoxification already?"

"Wise guy," said Angie. "I wanna find out something. Who's the little guy who was hanging around here while I was in cold turkey. All you



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guys was talking to him all the time, doing what he said. Who was he?"

"Why do you want to know?"

"He seemed like a good guy, like he knows what it's all about."

"Yes," said the intern. "He knows. That was Dr. Linden Grey, out of the Alexandra Research Center, up in Stamford. He's a chemist."

"You mean he's not a regular doctor?"

"That's right. He knows a lot about medicine, but he's not a regular doctor. He's a Ph.D., a chemist."

"In Stamford, you say? In Connecticut?"

"Yes. High Ridge Road. He's interested in narcotics users. Why don't you stop out and see him?"

Angie Grecca nodded and walked out up to Grand Central and caught the next train for Stamford. He was surprised at how close Stamford was. He caught a taxi out to the Research Center, and walked in the front door. The receptionist looked at his wrinkled clothes and his pallor and his generally seedy appearance and said, "The employment office is just down the hall. Go right on in."

Angie Grecca was used to going along with events to see what developed. The employment girl said to him as he came in the door, "The only thing open is a bottle washer. We call it a glassware maintenance engineer. You interested?"

Angie nodded, and she filled out the papers, and he signed them. An hour after he got off the train at Stamford, Angie Grecca was an employee of the Alexandra Research Center, washing laboratory glassware just down the hall from the laboratory of Dr. Linden Grey. In the hour or two left in the afternoon Angie learned about caustic solutions, rubber aprons, ultrasonic cleaners, chromate solutions, and hot water. especially hot water. He found a room in town that evening and blackened his moustache and shaved off his eyebrows and bleached his hair. When he saw Dr. Linden Grey the next morning, the doctor did not recognize him.

"What kinda work you do, Doc?" Angie believed in the direct approach.

Dr. Linden Grey looked down his nose that wasn't there, his head tilted back, looking with bright blue eyes at Angie. "Little of this, little of that," he said. "You new around here?"

"Yeah."

"My name's Linden Grey. Friends call me Lindy." He stuck out a hand.

Angie shook it, thinking what a friendly little cuss he was. Angie said, "My friends call me Angie, Lindy. What do you mean, 'little of this, little of that'? Don't you got a line of some kind?"

Grey's bright eyes sparkled, and he turned and tilted his head at a large, white oven-like affair in the laboratory. "I'm a chemist most of the time. And watch yourself with the glassware from this lab, Angie. Don't ever cut yourself with it. We



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try to clean it up before we let it out of here, but you know how it is. We miss a few."

"What's on it?"

"Well, maybe some poisonous stuff. Nothing too bad though."

Two bright-looking young people came into the laboratory. One of them was a blond girl, and her voice bubbled as she called out to Dr. Linden Grey, "Well, Nobby, in early again I see. Trying for another one, are you?"

"Yeah," said her companion, "let's get the last one wrapped up before we launch into another one. How're you this morning, Nob?"

Angie Grecca was a bit annoyed at the interruption; he had hoped to learn more from Dr. Linden Grey. But he responded politely when Grey introduced the bouncy couple as his associates. Grey used the title "glassware maintenance engineer" to describe Angie's job, but Angie quickly said, "C'mon, Doc. I'm a bottle washer." And as he shook hands, Angie could tell that the bouncy couple liked what he said.

Angie said, "I thought your name was 'Lindy'. These people call you Nob. Am I in the right house?"

They all smiled, and the blond girl said, "Private joke, Angie. Lindy here is going to win the Nobel Prize before too long. We just call him 'Nob' while we can."

Angie shrugged. "Don't know what the Nobel Prize is, but it must be good. Got work to do. See you around." He went over to the counter near the sink and began to transfer glassware from the wire holder to his cart. He moved quietly, making little clatter, and he got his reward. He heard Grey say to the others, "The slides came back, the ones from Turkey and Marseille. Come on over tonight, about seven, and I'll show them."

There was some quiet, close talk that Angie could not hear, but he was not concerned. In midmorning he found time to go to a telephone book and locate Dr. Linden Grey's home address. Right after work that evening he went to the Stamford Library. The Reference Room librarian turned out to be a stoutish, youngish woman who quickly made Angie feel that the most important part of her day was to supply him with the information he needed. He quickly learned much more about Nobel Prizes than he really wanted to know, but when he walked out, he was impressed. Angie felt that the bouncy couple had not really been kidding about Dr. Linden Grey and the Nobel Prize.

Angie had time to rent a car before seven o'clock, and it was while he was waiting for the papers to be filled out that he had the call. Just standing there, waiting for a form to be filled out, when the yearning unexpectedly swept over him. The longing, the need, the feeling in his loins that he needed Dame Horse, needed her bad. It was not the same as when he had the sweats. No goose



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flesh, no backaches, no chills. Just a longing, strong, imperative. He struggled, and thought about the bottom of the river, and in a moment he began to push it away from him. But the yearning stayed with him until the girl laid out the papers for him to sign. With other things on his mind, the power of the call faded, and by the time he had driven to Grey's neighborhood and parked the car a block away, he was in control again.

It was dusk as Angie strolled around the corner, looking everywhere except at Grey's house, blending in with one or two other strollers. He slipped into a stand of arborvitae and watched a car pull into Grey's driveway. As the bouncy couple went around to the front door to be let in, Angie went around to the back and quickly found himself a hiding place in the bushes near an open window.

He listened to the three of them chat as Grey set up a projector and screen. Then Grey went to the kitchen to get some beer before they settled down to watch the slides. Their conversation made more than enough noise to cover the sounds Angie made when he took up a position from which he could see the screen and hear plainly everything that was said.

A colored slide of an airplane sitting in an airport came on the screen, and Grey said, "There's my luggage going aboard—two suitcases, and the ten cylinders at twenty pounds each, right out in the open. We classified it simply as 'liquid fertilizer', and nobody asked any questions. Flew right to Ankara, got in at night the way we'd planned. Here's a shot of the lights of Ankara at night as we came in. And this one I made as Ambassador Oliphant and one of the Turkish ministers of health came out to meet the airplane.

Dr. Linden Grey shook hands with United States Ambassador Oliphant at the bottom of the stairs. The ambassador said, "Dr. Grey, I'd like you to meet the Turkish Minister of Health, Mr. Bayar. He has assured us of full cooperation in this matter. In fact we would all like to meet right now to iron out the last details, if you're not too tired."

"I'm fine," said Grey, "and I would like to meet now, too. The sooner we start, the sooner we'll get results." He shook hands with the minister, and the three of them watched while the ten cylinders were placed in the trunk of the ambassador's car. They drove to the United States Embassy and sat down around a table in a comfortable meeting room.

Mr. Bayar said, "I can't tell you, Dr. Grey, how vital to human welfare my government considers your work. We are all overwhelmed by the scope and sweep of your intellect. Your name will go down in history as the man who has done more for mankind than any other. We cannot tell . . ."



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Grey held up his hand, in deep embarrassment, and said, "Please, Mr. Bayar. First, it was largely luck on my part, and second, it is really a mixed blessing, like almost everything else in this life. Morphine has been a very useful drug when handled right, and men will now have to get along without it. This is a high price to pay."

Bayar waved a deprecating hand. "There are substitutes, plenty of synthetic substitutes, and the good far, far outweighs the price. No, Dr. Grey. This is a towering accomplishment."

The ambassador saw how Grey felt, and so he said, "Well, shall we make our plans? Mr. Bayar, will you tell Dr. Grey how you feel this should be handled?"

"Yes, certainly. Dr. Grey, we will take up a rather large airplane to spray the fields in Turkey. Fifteen of our people will go with you on the first trip to observe what you do. Once they've learned, we can dispatch smaller airplanes to spray the rest of the fields and to seed the air currents we've plotted to reach the critical regions of China, India and Pakistan. In a week, the virus ought to be everywhere we want."

Grey held up a hand. "Please, Mr. Bayar. Do not call it a virus; the name is too menacing. People may panic when the information is released later if they think they've been exposed to some sort of hostile virus. It isn't really a virus anyway. The name for it is 'pseudovirion.' "

"Oh. I thought it was a virus."

"No. It really is a gene wrapped in a virus-like coat. That's why it's so small, about one millimicron in diameter. No extraction processes will remove it, but it's not a virus. We call it PV, the abbreviation for pseudovirion. We think it's important not to use the name virus."

"Very well, Doctor. PV it is, from now on. All our airplanes are equipped to discharge the trickles of liquid in the form of aerosols having the stated diameter you specified. Why that exact diameter?"

Grey said, "So the droplet will fall to the ground in a reasonable period of time without spreading over too wide an area."

Bayar nodded and said, "I see. One more question, although I only ask it because the prime minister wanted me to make one last check. You are certain, are you not, that the material is harmless to human beings? I must make assurances again. Oh, I begin to see the importance of not calling it a virus. That must have been what worried the prime minister despite all the assurances from you and your government."

Grey nodded. "Many of us have been exposed to the pseudovirion. We know exactly what the effects are, and they are totally harmless."

"Good. I will relay that information, along with the fact that the material is not a virus. That should do it. Now, will you be ready to start in the morning?"



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Grey nodded, and Bayar said, "We'll put your tanks under guard for the night. We have, by the way, followed your suggestion of telling everyone save a very few that the material in the tanks is a new and vastly improved fertilizer on which we are experimenting. So even if word leaks out, it should be harmless. All right, gentlemen, see you in the morning."

There were no major problems the next day. A warming mantle did not function properly, and so the tank that carried the PV suspension did not at first build up enough pressure to form droplets of the right size. A few adjustments took care of it. Then the outlet end of the discharge tube turned out to be positioned incorrectly in the slipstream, but that was easily corrected.

The aiplane carried the latest electronic navigational gear, and the navigator was able to pinpoint each poppy field. One pass, on the upwind side of the field, discharging a few grams of the PV suspension was enough. Guards on the official government fields started to raise their rifles as the airplane swept low over the field, but the plane was gone before anyone could open fire. In the remote mountains, it was different. The mountain men were more alert, and several of the guards got off a shot or two at the plane as it swept low. There were no hits. And the poppy fields still got their share of PV.

Back on the ground after the day's run, Grey and the other scientists discussed improvements in the method of dispersing the PV. The next day Grey stayed on the ground and studied the proposed distribution system over the Jaldak and Shote regions. The Turkish government planes completed their work in Turkey that day. Over the next few days the operation expanded, seeding the winds to reach even the Nanking poppy fields. Then the time for good-byes.

Mr. Bayar held a small, quiet farewell party for Dr. Linden Grey. After the intensive efforts of the preceding few days, everyone was tired.

Mr. Bayar said to Grey, "Are you certain you will be safe in Marseille?"

"Oh, yes. Only the premier and two or three people in the Ministry of Health know what is happening. You need acetic anhydride to convert morphine to heroin, and there are only three manufacturers of acetic anhydride in the country. We'll be able to seed the entire supply with PV. Should be no problem. Should be easier than the far more intricate operation you ran here."

They drank a few quiet toasts, and parted. The next morning Grey flew to Marseille with the remaining half a tank of PV.

In his preliminary meeting with the French officials, Grey found that seeding the acetic anhydride supply in the area had already been planned for him. It was a simple matter of



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having an insurance inspector check the storage tanks and add the few ounces of PV suspension. But one of the three inspectors had a question. "Will this substance, this PV, survive being put in acetic anhydride? After all, acetic anhydride is strong stuff."

Grey nodded. "Yes, it will. And once in, it will pass through the entire acetylation of the morphine, and enough of it will remain with the diacetylmorphine, the heroin, so the user will get it."

"Will it have any effect on the man who does not use heroin?"

"None at all."

And so the seeding of the storage tanks was completed that afternoon.

The French were not as gracious to Dr. Grey as the Turkish. They politely thanked Grey for putting the illegal chemists out of business, but Grey had the impression that the French authorities were really more interested in putting a stop to the non-taxpaying chemists than in abolishing the synthesis of heroin.

The airplane trip home was uneventful, and after a day at home to get rid of his desynchronosis, Dr. Linden Grey showed up at his laboratory.

Dr. Grey turned off the bulb in the projector, but left the fan running to cool things off. When he went to a corner to turn on a table lamp, Angie Grecca quietly slipped out of the bushes. He quickly found the car and sat in it and stared out the windshield at the darkened street ahead. Heroin destroyed! He shook his head, unable to see the size of what Dr. Grey had done. No more lovely poppy fields, all gone, rotted away with some virus, or—what had he called it?—PV? Even the boys in Marseille, out of business, poisoned. And the siren wail came on then, the longing, the need. He had been a fairly good man, only doing what he had to do, so why couldn't—why shouldn't—he keep his little habit. It was a nice habit, he knew how to handle it, he didn't hurt anything with it. The tears welled to Angie's eyes with longing for the good Dame Horse. How he needed her now; he deserved her. But there was the matter of reporting to George Raft; there was a river to avoid. Blowing his nose, he started the car and drove to a corner phone booth and dialed the number. When he asked for George Raft, and told who he was, the gruff voice said, "Where are ya?"

Cautiously, Angie said, "A corner phone booth."

"Well, go to ya room. The Boss's waiting for ya there."

Angie hung up and slowly drove to his rooming house and slowly parked the car and slowly went up the stairs, knocked, and went in.

"Sit down, Angie," said George Raft, "and tell me what you know."

Angie was low. He needed a hit, a heart, something. He looked at George Raft and saw the bottom of the river in his face, and he didn't care. He said, "It's all over, Boss, the whole bit, done. This little guy here I



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told you about has ruined the business. He threw a virus, or something on all the opium fields, Turkey, India, China even. He had all them foreigners working with him, too. He ruined it where they grow it and he ruined it where they work it up, in Marseille. I don't know when I'll see any good horse again. It's all gone." Angie leaned forward and put his face in his hands. The next thing he knew he was yanked to his feet by one of the muscles with George Raft, and Angie got a stinging slap across the face. He stood, looking at George Raft who was cleaning his fingernails, waiting for another slap, not caring.

George Raft said, "Angie, you're not telling it like it is. I don't like to keep reminding you, but we got a place all picked out for you, at the bottom of the river. Now you tell me like it is, huh?"

"I told you like it is. You don't like it, lump it." Slap. "And as far as I'm concerned, you know what you can do with the bottom of the river, too. I've had it with you and your muscles. I did what I told ya."

"Hold it." The muscle's hand had been raised for another slap, but George Raft looked up and stopped it. He looked at Angie Grecca and saw no fear in his eyes, no sense of lying. He waved the muscle to a chair and said thoughtfully to Angie, "O.K., Angie. I thought you were putting me on, but maybe not. Maybe you don't know what's been happening the last two days. Sit down, and I'll tell you." Angie sat.

"You been telling me the heroin's been ruined. But I happen to know it hasn't been ruined. I had some guys examine it, the best guys money could buy, and it's real horse. It ain't been ruined at all. Yet when a junkie takes a hit of that same stuff, nothing. So they done something to it, all right, but I don't know what. You hear? It's the same old heroin, but it don't work no more. You know anything about that?"

Angie was puzzled, and slowly he became interested. He thought back over everything he had heard that evening, but it didn't help. Slowly he shook his head. "I don't know nothing about that. But I bet I know who does. That Dr. Grey, *he* knows. I'm sure he knows."

"Can you find out?"

Angie nodded, and the more he thought about it, the faster he nodded. This was something for him, too. Unless somebody found out what was going on, it looked as if he could never again look forward to the sweet caress of Dame Horse, and that was a thing he did not want to think about. So Angie nodded and said, "I can find out."

"How long do you think it'll take?"

"How do I know? I been moving real good, so far, haven't I?"

George Raft nodded. "O.K., Angie. I think I'll hang around this town for a day or two. I got a big investment. You find out for me real quick what's going on. I'll make it



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right for you if you do it quick."

Angie hardly heard him. He vaguely nodded and turned away, wondering how he was going to get the information he wanted from Dr. Linden Grey. There had to be a way, but he needed to think it out.

George Raft stared at him a moment, then got up and said, "O.K., Angie. I'll be over at the Roger Smith. See you." He and his muscles left.

Angie slowly undressed and went to bed. He intended to lie there and think about his problem; he always did good thinking just before going to sleep. But he was tired, and without realizing it, he slipped off into a deep sleep and did not wake up until the sun burned in his window. He dressed and left and ate breakfast thinking about the problem, but he had not solved it by the time he entered the glassware wash-up room and put on his apron, mask and gloves. He put in a good hour's work, and then pushed the glassware cart to Dr. Grey's laboratory to pick up some more glassware, and to look around in the hope that something would turn up.

Dr. Grey stood in a corner of the lab talking to several laboratory personnel including the bouncy couple. There were four strangers with them, scientific types, and by moving closer Angie learned that a meeting was about to begin. To kill time, Angie began rinsing out some of the glassware right in the lab and carefully stacking it on his cart. He carefully emptied the water from the jackets of some of the glass columns and poked out some of the granular solids that had collected at the outlets. The meeting started in the adjacent conference room, and Angie worked industrially right near the door. He suddenly became aware that two men were standing quietly behind him. He turned casually to look at them.

Each was about forty, each was dressed in an unobtrusive dark suit, with a white shirt and quiet tie, each wore black shoes, each looked in the pink of physical condition and stood alertly on the balls of his feet. One look was enough for Angie, and the blood drained from his face as he recognized them. Feds.

One of them said, "Why don't you join us, Angie?"

"Why, I uh—"

The other took him by the arm and said, "It's all right, Angie. Come on in and join the meeting." The other stepped to his other side and the two of them half carried him into the meeting room. They stood him near a chair.

Dr. Grey looked up at him and said, "Morning, Angie. I hear you were at my house last night?"

Angie could not speak to him; his mouth hung open. The two men gently guided him into a seat, and then sat down themselves. The man at the head of the table said to Angie, "My name is Paton. After we learned you were in Dr. Grey's



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house last night, we did some checking. Now, we know you went through detoxification last week, and we know you have a contact with Johnny Mafiosa, and we know you turned in a couple of his boys a few days before that. But we don't know what you are after here. Suppose you tell us."

Angie gulped and tried to think of something to say, but he could not. When he thought of telling them what he was really after, all he could see was the bottom of the river again.

Dr. Grey said gently, "Angie, I thought that all you wanted from us was information on what has been happening to the heroin. Is that right?"

Angie's face flooded with relief, obvious for all of them to see. He gulped and nodded. Dr. Gray continued, "You're on a spot because you turned in those two hustlers, and you've got to turn over information?"

Angie nodded again, feeling better all the time. They already knew, so he had not told them after all. George Raft couldn't hold that against him. He looked around, more relaxed now, his mind functioning clearly again, and he realized there was no hostility in the people around him. Quick to sense an advantage, he said, "Yeah, Doc, I'm in a spot. Can you tell me what you done to the horse?"

Dr. Grey glanced at Paton and then said, "Yes, Angie, we can tell you. That's what this meeting is all about. We're going to tell several science reporters what's been going on, and you can listen in. Tonight the news will break in the International press, but we'll let you and the underworld in on it a few hours early; you'll hear it with the reporters. O.K.?" Angie nodded, dumb again, and Dr. Grey continued, "One thing, Angie. Please don't make a big thing out of this when the reporters get here, unless you want your name in the papers, too. O.K.?"

Angie nodded and sat back and relaxed. The others talked softly among themselves, and in the peacefulness of the moment Angie began to feel the call again. The oddity struck him. Sitting there in the middle of the Feds and these big brains who had done something to the heroin, he had to get the urge for a hit. It was almost funny, but the humor did nothing to cut down the need. And the need was growing and beginning to make him restless when the first reporter walked in. Angie could tell he was a big shot from the way he looked around and did not seem glad to be there. He wore tinted glasses. The others arrived, five in all. Each of them had that same odd manner of wanting to be somewhere else, and none of them smiled. Paton said, "Please sit down, gentlemen. I'll be brief." He waited while the group took chairs and looked challengingly at him. Paton stared back at them a bit longer than necessary, long enough to make the



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situation slightly uncomfortable. Then he said, "We have called you here to announce that Dr. Grey and his group," he nodded toward the end of the table where they sat, "have accomplished a feat which has eliminated the effects on the human body of heroin, morphine or any morphine derivatives, and methadone."

Angie frowned when he heard it. Now he knew. He didn't know how, but it didn't seem important either. In his bones he felt that his days of play at the syringe were over. The five science reporters looked blankly at Paton, uncomprehending. Paton said, "You did not understand what I just told you. Mankind can no longer respond to the opiates as a result of the work done here over the last few years." He waited until he saw a glimmering of intelligence appear in the eyes of the reporters. They straightened in their chairs, and two of them even took out small pads of paper and placed them in front of them, apparently getting ready to take notes. Paton leaned back and said, "Dr. Grey will explain what he's done." He nodded at Grey.

Without preamble Grey said, "Six years ago my colleagues here," he nodded toward the bouncy couple, "found an enzyme that quickly reduced morphine to a series of biologically inactive degradation products. The enzyme can float in the human bloodstream, and it will then destroy all morphine in the bloodstream before the blood can carry the morphine to the central nervous system. As we explored it further we found that the enzyme also acts on heroin. Heroin is merely diacetyl morphine. We found out that the enzyme will destroy all opiates, and we were able to isolate the exact sequence of atoms it attacked. It attacks the quaternary carbon and the two adjacent carbons along with the tertiary nitrogen. So it also destroys methadone. It even has a slight effect on LSD which has a closely related structure. So then we . . ." He stopped, noticing the completely blank look on the faces of the science reporters. He shook his head and said slowly, "Let me put it this way. We found an enzyme that can float harmlessly in the bloodstream and at the same time quickly destroy all opiates. You can think of it as an opiate destroyer. Call it opiase. Understand?"

They understood, and several began to make notes. Angie understood, too. He could see that dame horse was growing less reliable every moment. One of the reporters said, "How do you make the user take the enzyme?" It seemed like an intelligent question, and Angie thought he knew the answer. You mixed the enzyme with the heroin, that's how.

Dr. Grey said, "Well, that's the next part of the story. The discovery of the enzyme came at a time when my own work on viral infections had produced some interesting results. We found a material to implant a



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gene in the nucleus of the cell it infected, and no more. The gene controlled protein production of various kinds. So we built it to control production of the enzyme. That's all there was to it." The reporters stopped making notes and looked up, the usual blank look on their faces. Angie was puzzled, too, and when Dr. Grey saw that Angie was puzzled, he realized he had not made it clear enough.

He said, "Let me put it this way, simply. We made a material, a pseudovirion, that implanted a new gene in the human chromosome. O.K.?" He waited for the nods all around. "That gene's sole function was to make an enzyme. O.K.?" The nods came. "That enzyme destroyed all opiates in the human bloodstream. O.K.?" The reporters were getting a bit resentful, but they nodded. "So anyone infected with the pseudovirion can never get the slightest effect from any of morphine, heroin, codeine, dihydromorphinone, dihydrocodeinone, oxycodone, thebaine, metopon, pethidine, ketobemidone, alphaprodine, trimeperidine, piminidine, methadone—shall I name some more?" The blank stares were back, but Angie had quit listening once Dr. Grey had got beyond codeine. Mild stuff, codeine, but it would do in a pinch. And even that was denied to him now; Angie knew he had been infected. The yearning came again, worse this time, because he now knew he could never assuage it.

Dr. Grey continued, "We did some traveling and seeded all the illegal poppy fields we could locate—doused them all with the pseudovirion. We also got access to the crude opium and crude morphine in Marseille and infected it with the pseudovirion before the chemists could diacetylate the morphine and make heroin out of it. In that way we passed on the pseudovirion to all the users. It forced them to undergo withdrawal and made it impossible for them ever again to get any effect from a shot of any of these narcotics. That's about it. That's where it stands today." He fell silent.

The reporters looked at one another, and one of them said, "Wasn't it pretty high handed of you to go around infecting people at your own whim? Where are the rights of the individual?"

Dr. Grey looked down at Paton, and then looked down at the tabletop right in front of him, and slowly shook his head. Paton spoke up. "We have eliminated harmlessly one of man's most pressing modern problems, and your only comment is to question whether we've violated individual rights." Now he shook his head. One of the reporters started to speak, but Paton raised his hand and said, "I gather you don't appreciate what you heard. It was the *illegal* fields that were infected, the *illegal* morphine and opium that was infected. Heroin is illegal the world over, wherever it is found. Every user was in violation of the law.



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That's how he got infected. To say it violated his rights is the same as to say his rights were violated by arresting him when he used it. His act of use was illegal, and that's how he got the harmless infection."

The reporters made notes, and Paton said, "I'm surprised one of you hasn't raised the question of what the pseudovirion does to legitimate uses of morphine. Doctors can't use it any more for deadening pain, say, in terminal cancer."

"I was just going to bring that up."

"Sure. Well, we took a consensus of medical authority, and we learned there are enough substitutes. Morphine will be missed, but not badly."

"Well," said one reporter, "I'm not sure I buy your arguments. I may not run the story, at least not yet."

Paton said, "That's all right; it is certainly up to you. We asked you here to give you an advance announcement. We did not prepare a handout because you are all leaders among the science reporters and we thought you'd want to write your own stuff. However, that's up to you. Tomorrow's issue of the journal *Science* will carry a complete scientific explanation of everything we've done here. I understand the entire issue will be devoted to it. So you can wait and study it before you publish anything." He looked around. No one said anything, so he stood up and said, "Well, that's it gentlemen. Thank you for coming." The reporters filed out quietly, and Angie began to follow them. His face was sorrowful, reflecting the longing he felt.

Dr. Grey put a hand on his arm and said softly, "Is it really that bad, Angie? It's for the best, you know."

Angie looked at him sadly, and said, "I had a good habit, Doc. I managed it, used it right. It was a good habit, gone now." He shook his head sadly.

Dr. Grey comforted him, talked to him for a few moments, then watched him walk slowly away.

Angie went to his room and sat down quietly while George Raft and his muscles watched him. "Well, well. Whatcha find out?"

Angie looked up, startled, and then said, "Oh, yeah. Well, Big Boss, you gotta find a new line of work. Narcotics is all gone now. You know what that Doc's gone and done? He's given everybody a virus, see?" And Angie told the whole story. George Raft asked many questions, and finally understood what had happened. He sat quietly for a long time, and then sighed, and stood up and said, "All right, Angie, you done good. Here's some dough." He tossed a bundle of bills into Angie's lap, but Angie paid no attention. George Raft said, "I need a drink. See you around, Angie." He headed for the door.

Angie stirred himself and looked up and said, "You better hurry if you want that drink. This Doc, he's a pretty smart guy. He just told me he's got another virus now, and he's gonna release it soon." ■



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# alpha-wave conditioning

## Or how to "turn on" without drugs, or twenty years practice at Zen meditation!

by K. C. KEEFE

Consciousness, and its various states of manifestation, has classically been held to be within the province of the philosopher or the theologian, and not within the domain of the scientist. It is a concept which science has shied away from since the Nineteenth Century because of the lack of objective and easily verifiable facts. The fact that man can, with ease, alter his consciousness is, by now, well-known. The fact that man has, historically, used many methods to alter his consciousness is also well-known. But what the parameters of such alteration are, and what its ultimate effects are, is less well-known.

The range of techniques for altering consciousness is vast. Among the better known are: meditative methods, body control, dance, sensory inundation, sensory deprivation, the use of naturally occurring substances such as ethanol, nitrous oxide, jimson weed, marijuana, peyote, canabis, psilocibin, and the use of synthetic substances such as LSD-25, DMT, STP, mescaline and others.

Now a new technique is emerging for the production of an altered state of consciousness. This new technique is the operant conditioning of brain activity itself. But before we consider this new technique in any detail, let us briefly review the history of the study of consciousness in order to see whether this new technique might be able to provide some new insights into some very old problems.

The first difficulty, which Western man encounters in studying consciousness, is the semantic difficulty of finding accurate definitions, within our language, to represent the phenomena which are being studied.



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We generally define the state of consciousness in which we perform our ordinary day-to-day activities as our "normal" state of consciousness. We also generally assume that one person's "normal" state is very similar to that of another person—an assumption whose validity the philosopher could well argue, but one which we will accept for the purpose of our investigation.

By this definition, an "altered" state of consciousness would be one in which the individual notes a qualitative difference in his mental processing: basically, he *feels* that his consciousness is different. Different from what? Different from his "normal" waking consciousness which is, of course, culturally determined. What we might define as an altered state of consciousness could, for another culture, be defined as normal. For example, Frederick Spiegelberg[1], an Indian scholar, has pointed out that in Sanskrit there are at least twenty nouns which are used to identify various states of consciousness, all of which we translate into the two words "consciousness" and "mind." We have not developed the sensitivity to the subtle differences which the Sanskrit identifies. We have a poverty of language with which to represent altered states of consciousness, at least partly because of our scientific bias against investigating this area. Operant brain conditioning, however, may provide a new scientific framework from which to develop such an investigation, and may, in the process, enrich our language concepts about consciousness as well.

For the present, an investigation of consciousness is still an exploration into a realm of conceptual ambiguity. However, there are some points from which we can begin to venture, with the assurance that we are starting from firm common ground. The most important of these is that all methods for inducing an altered state of consciousness have one thing in common. They all attempt to change the activity *of the brain,* for we generally consider the brain to be the seat of consciousness. In other words, man's attempt has been to develop control of his brain-consciousness.

People learned to control the activity of their own brain-consciousness centuries ago. Probably the first method which was used, and one which still finds favor throughout the world, was alcohol. Almost all of us know the effects of alcohol on the activity of the brain-consciousness at the time of its use, and the dramatic effects the morning after. Other techniques for altering consciousness which have developed since the use of alcohol have often had in common an attempt to achieve a similar alteration while eliminating the pangs of the "morning after" of any particular preceding technique. In fact, one could probably write a valid history of the development of various methods for



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altering consciousness in which it could be shown that this development was primarily the evolution of the effort to "get high" without having to suffer what were felt to be the ill effects of previous methods. Operant brain conditioning experimentation, and specifically alpha-wave conditioning, has also been influenced by this motivation and has added to this evolution.

There is a parable about the person who is seeking to gain control of his brain-consciousness which outlines the ways in which the person can achieve this control. The story describes the way of the fakir, the way of the ascetic monk, the way of the yogi, and the way of the wise man, and demonstrates how each new method adds a dimension to the method before. Meditation—a regimen of purely mental exercise—is added to the technique of physical exercise, for example. The parable describes the wise man as the man who utilizes the widest range of knowledge of the world, including a knowledge of science, to produce the most efficient method for altering consciousness.

The wise man may now have new knowledge, a new "way" which science has produced: the conscious control of the brain's activity by listening directly to the brain functioning and learning how to alter that functioning.

It is interesting that this new scientific effort has emerged, primarily, from studies of meditation in an attempt to clarify the psychological parameters of such "mental" exercise. One of the most extensive and careful studies of the physiological changes which occur during Zen meditation, was that of Kasamatsu and Hirai[2]. They found that there was a high correlation between certain electroencephalographic (EEG) patterns and the number of years of Zen meditative practice. There was also a high positive correlation between the EEG pattern and the rating which was given by the Zen master as to the student's ability as a meditator. The patterns which were noted in the EEG records in this study showed that: (1) there was a slowing of the alpha-wave frequency, which is normally from 8 to 12 cycles per second (see Fig. 1); (2) there was prominent alpha-wave activity with the eyes open which does not normally occur to the degree that it did with experienced meditators; (3) there was increased alpha amplitude—that is, the signal was stronger; and finally, (4) there was the appearance of trains of theta-wave activity, which is even slower than the alpha frequency. This theta-wave activity only occurred in subjects with twenty or more years of practice at ZaZen or Zen meditation.

Anand, et al.[3] found that Yogis produced high amplitude alpha activity during their Samadhi meditations, even with a hand immersed in ice water for up to 55 minutes! In addition, they found that those students of Yoga who had the most ap-



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titude and perseverance in their yogic studies also had a history of well marked alpha-wave activity in their EEG records.

In terms of our interest in the evolution of consciousness and its study, past and future, it is interesting to compare the papers of Kasamatsu and Hirai, on the one hand; and Anand, et al. on the other. Such a comparison reveals the following: in normal subjects, alpha activity can be blocked by various sensory stimuli—for example, a loud click. For the Yogis, however, there is *no* blocking of alpha activity by external sensory stimuli, while in the case of the Zen master there is alpha blocking but only for a 2-3 second interval, and this interval remains constant.

In the case of a normal subject, the more the external stimulus occurs, the less blocking there is. That is, the typical subject adapts to the stimulus and, in effect—or in reality—does not hear it after a while. It would appear that the Yogi is totally screening out the stimuli of the external world, that the Zen master continues to respond to those stimuli, while the normal person tends to begin to block out those stimuli which have no relevance to him. Here is where brain-wave research begins to lead to a synthesis of the scientific and the philosophic realms of interest, for this interpretation of the research data would seem to be a validation of the differences in philosophical world-view of the various subjects.

The Yogi, during his Samadhi, is attempting to withdraw himself from the world of illusion—Maya—for he believes the sensory world to be illusory.

The Zen meditator, on the other hand, is placing himself totally within the world and maintaining sensitivity toward all of the data presented to him, for he believes that there is no illusion, that all is real, and that enlightenment means to have the entire personality fully awake to reality.

The point of view of the average subject in a "normal" state of consciousness is one of personal relevance: if the stimulus isn't going to "do" anything—to me or for me—why pay attention to it? So we see that our investigation of brain-wave research may be leading us to the potentiality for overcoming the bias which was our original concern: the divorce between science and philosophy in the study of consciousness; for here we have the possibility of a "scientific" validation of the effect of a "philosophic" position.

Other brain-wave research, more particularly research in brain-wave conditioning, leads to even more interesting and fruitful possibilities for this new synthesis of science and philosophy. Dr. Joe Kamiya[4], for example, has uncovered some remarkable things. He began by asking: "Can people be trained to discern the comings or goings of brain



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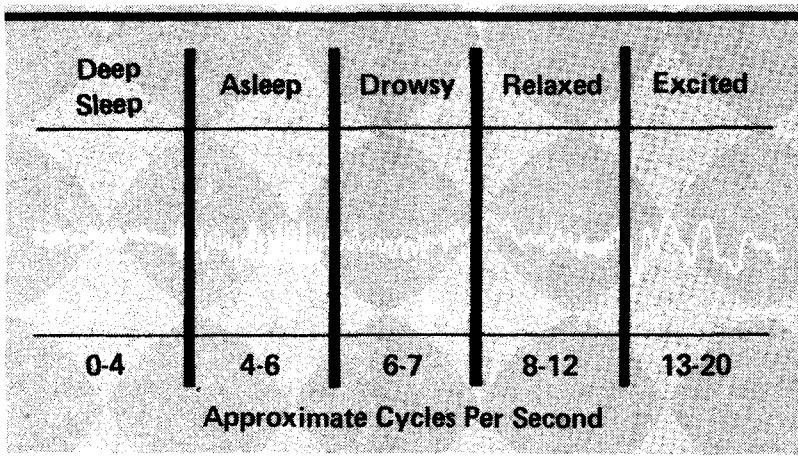


*Fig. 1: RANGE OF BRAIN-WAVE FREQUENCIES: Brain waves typical of various states of consciousness, from sleep through relaxed wakefulness and more excited states, as taken from the records of the Electroencephalograph (EEG). The EEG uses special electrodes to pick up these waves, which are not "broadcast" as sound waves are. The signals are then led through wires to an amplifier, and are then passed on to an oscilloscope which makes the brain waves visible. Developed by Hans Berger in 1929, the EEG made it possible for scientists to "look in on" the intact human brain in action. One of the first important facts discovered through the use of Berger's invention was that spontaneous electrical activity may be recorded from the human brain whether a person is awake or asleep, excited or relaxed. The amplitude and form of the brain waves may change with these various conditions, but the* electrical activity is incessant. *The constant and rhythmic series of waves occurring at about 8-12 cycles per second, in the state of relaxed wakefulness, is referred to as the* alpha wave.[6]

rhythms, say the EEG alpha rhythm, just by using the standard learning procedures that have been developed for use with rats and pigeons?"

Using an EEG, he asked subjects to say whether they were in state "A" or "B" at the sound of a tone. (Kamiya, studying the EEG patterns in a room separated from the subject, was able to identify these states as alpha-wave activity and other patterns, although this identification was not offered to the subject.) The subject was told whether he had



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made a "correct" response, and at the end of three hours subjects had learned to correctly identify the different states at a rate of 75% to 80% correct responses, with some subjects even hitting 100%. Interestingly enough, the subjects, even those scoring 100% correct identification, were unable to say how they had accomplished this feat.

The next phase of Dr. Kamiya's work was to see if his subjects could produce the states which he had called "A" and "B" upon command. The task was to produce EEG pattern, or brain state "A" upon one signal, and "B" at another—and the majority of his subjects did just that. Having learned to identify for themselves a brain state, they were then able to turn it off or on at a command. But was it even necessary that the subjects first learn to identify the brain state in order to learn to control it? Kamiya began using a sine wave tone which appeared when the alpha-wave, or state "A" was occurring, and gave his subjects the following instructions: "Hear that tone? That's turned on by your brain wave. Now let's see if you can learn how to control the percent of time that the tone is present. First we'll have you try to keep the tone on as much as you possibly can, and then we'll have you try to keep the tone off as much of the time as you can." He then proceeded to test to see if learning could occur under these conditions. The result was that the subjects indeed learned to control their own alpha rhythm, and in addition he found that many of these subjects could describe how they turned off the alpha rhythm: for the most part they used visualization of an object or person, or they worked on mathematical problems or similar tasks of concentrated mental effort.

Another curious dimension of the research was that the descriptions of the alpha-on state began to emerge from subjects in statements which seemed to have a Zen ring to them. The most common description of the state of consciousness achieved and used in controlling alpha production was "peaceful, tranquil and relaxing" or "centered, in touch with myself." Many reported that they continued to try to "turn on" the alpha rhythm during their normal waking existence, and many others reported that they felt "energized" or, in general, more effective in their functioning than they had been before the learning experience. No ill side effects were observed or reported by subjects. So that it began to appear that yet another technique for the conscious alteration of brain-consciousness: operant brain conditioning, had emerged. This technique appeared to be relatively speedy and efficient and seemed to have no "morning after," which might explain why when Dr. Kamiya began his work he had to pay his subjects, whereas now he has a waiting list "a mile long" of people waiting to serve as subjects.



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Dr. Kamiya also found that his subjects could continue to improve their performance with continued practice, in the case of one subject the improvement going from 15% to 85% alpha production. In addition, those subjects who had practiced various forms of meditation seemed more adept at learning to control their alpha, a point which might well be considered in relation to the study of Yogis which demonstrated that the yogic adepts—those who persevered and improved in yogic meditation and practice—had a history of high alpha production.

A further aspect of Dr. Kamiya's research showed that his subjects could also learn to control the *frequency* of the alpha rhythm. In some cases they were able to shift the frequency by as much as 2 cycles per second. This point should be considered in relation to the demonstrated Zen master's ability to slow the frequency of his alpha, in some cases down to 6-7 cycles per second, or within the theta range of brain activity. The only modification of alpha-wave activity left unstudied was that of amplitude, a factor left for consideration in the next phase of alpha conditioning research. Dr. Kamiya's contribution was to develop an instrumental—operant—conditioning method of training subjects to control both alpha-wave production and frequency by means of extroceptive feedback. Such a technique for the conditioning of what had previously been described as "autonomic" systems, such as heart rate, respiration and pupil dilation and contraction have been well reported. We might even think of the astronauts, for example, as a kind of Yogi since they have had to learn to control their autonomic nervous systems—using scientific techniques, as the "wise man" did—in relation to stress tolerance to a degree seldom before known to man.

The next development in alpha-wave conditioning research emerges, really, as a result of the widespread positive effects experienced by the subjects who were veterans of the early research. From the subject's point of view, the only difficulty, or drawback, in the alpha-wave conditioning experience was the fact that it was still necessary, in order to learn the method, to have access to a medical research facility which was the only place that had the extensive and expensive hardware used in the prototypical experimentation. The typical EEG machine in use in most research, or medical centers, costs about $10,000 and is complex enough to require a specially trained technician to operate it. In addition, in order to use the EEG in an alpha-wave operant conditioning context, some modification of the basic equipment is required since the ordinary EEG unit is primarily a detector and not a feedback device.

Thus the need was felt for a small, inexpensive EEG which would be specially programmed for alpha-



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wave feedback. This has now been accomplished.

In 1968, a small group of veteran subjects of alpha-wave conditioning research formed an electronics company (Phenomenological Systems Incorporated) to produce just such a miniature EEG unit. One of the major design problems which had to be worked out initially was the high noise-to-signal ratio. The brain is putting out alpha-waves on the order of, usually, 20-30 micro-volts and the electrical field in the typical home is often higher than that. There is a lot of free energy floating about. There had been two standard solutions to this problem: (1) to use subdermal electrodes, which are not very comfortable to say the least, and (2) to place the subject in a specially constructed room with copper shielding used to screen out any electrical interference.

One of the first attempts to solve this problem without recourse to these cumbersome laboratory solutions with their obvious drawbacks, was to develop a shielded hood affair that looked much like milady's hair dryer and which still used subdermal electrodes mounted within the hood. The effect was that the subject sat down and literally placed the unit on to, or rather into, his head—a not very satisfactory solution. In order to solve the problem more effectively, it was decided to shoot for the most compact unit possible, and to see whether the signal-to-noise ratio problem could be solved strictly through electronic means. Some new integrated circuits were investigated with this in mind, and by 1969 a lucky combination of these elements was found which produced such a functional unit. Because it was only focusing on the alpha component of brain activity—i.e. used only one specialized channel while most EEG units are 8-12 and up to 24 channels with each channel looking at the entire spectrum of the brain's activity—it could be produced compactly and inexpensively.

The unit (Model 360) includes a small black box, approximately 1″ x 1″ x 2″, which contains an entire EEG machine miniaturized and programmed for the very special purpose of detecting and feeding back the alpha rhythm. This small black box is attached to a pair of headphones, giving the subject the opportunity to learn to control his alpha rhythm through a direct and immediate feedback system. The unit is battery operated, so that the subject is free to move about a room, practice while he is walking and even while out of doors since there are no external connections other than the large disk electrodes which are placed on the surface of the head.

The first sound which the subject is apt to hear on using this new unit, is the sound of his own eyes blinking. If he closes his eyes, he will hear some background noise as the result



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of his beta-wave production, and after a few moments he will most likely begin to hear an overtone-beat oscillation which is the alpha-wave. Then begins the fascinating, and in some way not yet fully describable, task of learning what the conditions are which for each individual will produce a higher percentage of alpha.

The same electronics company has also produced a research model which contains an FM telemetry unit which will allow the subject's alpha production to be charted, or to be fed through a zero crossing detector which will provide an instantaneous count of the production of alpha for a given period of time. The telemetry unit will also be capable of driving a light in such a way that it reflects the alpha production, thereby allowing the subject to control his alpha with eyes open. The possibilities of an application of alpha conditioning with eyes open are interesting to speculate on. One psychiatrist[5], for example, is training his subjects to control the light of a slide projector such that when alpha is being produced a picture is projected on the screen. However, when the subject consciously begins to respond to the picture, or attempts to focus on its detail, the alpha production ceases and the picture is no longer projected. This relationship between visualizational activity and blocking of alpha, which Kamiya had noted in his subjects' descriptions, when applied with the use of a

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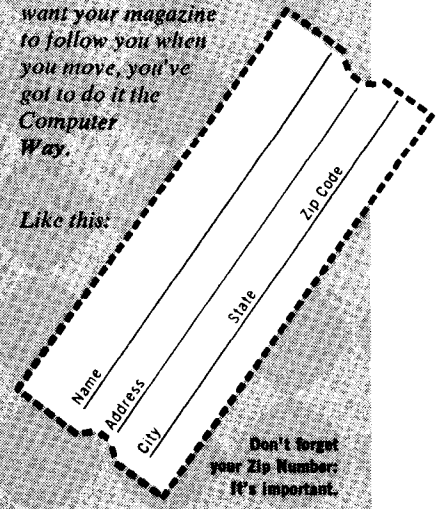


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modified telemetry unit, for example, to eyes-open conditioning, offers some interesting therapeutic potentials. One such potential would be phobia desensitization, where the visual projection used would symbolize the subject's phobia toward which he wished to de-sensitize himself. The subject's alpha-wave conditioning, a state he could be expected to enjoy as the research has shown, would then demand his de-sensitization to the visual stimulus of his phobia since any focusing on, or responding to, the symbol would immediately block alpha production. His learned non-response to phobic symbols would automatically be rewarded with higher alpha production in the normal course of the conditioning experience. This use of alpha-wave conditioning has yet to be tested and is still in the planning stages.

Also in the planning stage are several other fascinating potentials. Consider what the results might be for an understanding of consciousness if two people were able to synchronize their alpha rhythms. Would their communication be different? If so, how? Might we not anticipate a wealth of new data on the range of states of consciousness—already known to and identified by the Eastern world through lengthy and painstaking meditative regimens—through such a technique for the sharing of altered consciousness and the mutual description and verification of these states? And, as long as we are in the realm of creative hypothetical fantasy, it should not be too long before someone could control the input of an electronic music synthesizer strictly through the use of pure brain-wave activity. In a real sense, then, he would be playing the music of his own mind. The "Star of the Unborn" begins to shine more brightly. ■

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# the habitat manager

They were very helpfully seeing to it that
The Scientist found exactly what he expected.
Wasn't that what he'd sought to find?

S. KYE BOULT
Illustrated by Michael Gilbert

The pounding on the door was now violent enough to affect her respiration, adrenalin balance and nervous tone, so Dr. Boon gave up his examination and removed his instruments.

Dr. Boon said, "My dear Jme, either you leave my office and report back to duty, or check into a hospital and do this right. You are entitled to hospitalization, you know. My door is not, I might add."

Jme said, "No hospitals, Boon, old friend. How am I?"

"Wonderful! At the first knock you went straight off my recording paper. Right now your respiration is up and you've got enough adrenalin to keep you moving ten minutes after you're dead.

"Jme, Jme, slow down. You are absorbing energy faster than my life-support lamps can put it out."

Jme curled up on the examining table and said, "You always complain about the power drain when I come in. It used to be my beauty, you said. Now, that I'm getting all wide and flat . . ."

He said, "Don't be coy with me. You are alive, very healthy . . . and will reproduce at the proper time without medical problems. I refrain from saying reproduce normally. Nothing you do is normal. But healthy. Satisfied?

"Now get on that communicator and save my door!"

Jme colored and asked, "Doctor, can that be delayed?"

Dr. Boon scanned her record cards. So, that was the problem; reproduction fear syndrome, bah! His mind flashed to three tests he wished he had remembered to make. He pretended to misunderstand her and answered, "My door? Not very long. They will break through it at the rate they're pounding. Who's out there?"

She pressed, "Not the door, Boon—the other. Reproduction?"

He scooped her off the examining



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table and whirled her in front of a polished metal cabinet door. His voice vibrated with his anger as he said, "Look at yourself!"

Jme saw herself in the polished surface. Her body was a flat, rather thick, sheet of protein flesh, just a meter tall and about two thirds of that wide. Her pale gray sensory surface had a ten-centimeter bar of modulated black running width-wise across its top quarter. She was absorbing visual light in that area in order to *see* her reflection. Beside her the doctor was gripping her with his arms. He was taller and thicker and his flat sensory surface was mottled with darker gray areas of age. He, too, had a black band of sight receptors energized, and below that a white area radiated sonic frequencies when he yelled at her.

He spun her sideways and held her so she couldn't extend her arms for balance. She had to curve her bottom edge quickly to keep from falling.

He said, "Look at that sigmoid

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curvature. That's the finest I've seen in twenty years of practice."

She couldn't see much of her reflection with her sensors turned away, but she *was* proud of the curve of her back and smoothed it's S-shape instinctively.

Dr. Boon thumped her on her back with one arm and said, "Back a dull black; not a spot of shine anywhere." He spun her around to face the mirror again. His voice dropped in volume and he said, "Jme, take a good look. You're young and beautiful."

She said, "And wide."

He dismissed this. "Three centimeters, *poof!* Don't interrupt my diagnosis. Heh, now . . . you are also the youngest and prettiest Habitat Manager our race has on this side of the planet. You've only been in rank ten weeks, but so far the Central Government is backing every decision you take. So far as I can see you've got it made. *So, where did you leave your brains!!"*

He let go of her and went on sternly, "I make some allowances. This *is* your first time and you are entitled to some maidenly squibbles. But, don't you ever, ever, ask me to break the law, or to kill a life that hasn't lived!"

She squirmed a little. "Oh, no! I didn't mean . . ."

He wanted her to know in her own mind what she did mean, so he went on cruelly, "Think, beautiful. You are a Habitat Manager. You know biology as well as I do. What you are asking can be done, Jme, but the word is *death,* not delay."

Jme curled up a little, then stiffened into an erect S-curve. Her voice became formal with the almost masculine frequencies of command she used in her work. She said, "Doctor, I asked you for a medical opinion. I am a Habitat Manager, as you remind me. That noise on your door, means that decisions I take in the next few hours may affect the racial survival of many species"—she paused, and went on weakly—"or they might, if I leave here." Then she gathered more strength, turned to face him and said, "Therefore, as Habitat Manager, and officially, Dr. Boon, I must have an answer to my question—now! For the duration of an emergency, can it be delayed, Doctor? *Delayed!"*

He had made a mistake. Oh well, diagnosis without tests. . . He answered her in formal frequencies, "Reproduction? No, in no important way. Delay is beyond my skill. You may be a Habitat Manager now, but your body is busy getting ready to insure *your* racial survival—in case your mind bungles the job. Science cannot help or delay such a basic physical process. It will go on, my dear, normally, or it can be curtailed . . . terminated.

"However, *I will not do that.* If that is your decision, I will fight it as your medical adviser long enough to keep you locked in a hospital through any conceivable emergency!"



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She soothed, "Relax, dear Dr. Boon. You should know from my medical profile, that I would never take that sort of decision. I don't know what got you on such morbid thoughts. You know my sensitivity to life. It was only the time . . ."

Dr. Boon had made a mistaken diagnosis and also a mistake in character judgment, so he fed her a platitude, saying, "Nature's timing of such things is always wrong." He had better run the energy lamps in his office at a higher output. He was getting old.

The Communicator on his desk began to radiate an insistant call signal. Dr. Boon stared at it in amazement. Somebody had an override canceling his *medical* privacy code.

The door gave up its resistance with a tearing crash. It swung open against the wall to hang on one hinge. The doorway was filled with the bulk of a Runner. Dr. Boon had seen Runners before, but never this close, or this violently. He was big, of course, a surface running quadruped had to be big. This one filled the doorway. His muscles, heaving from the exertions with the door, rippled his rusty red hide. His mouth was snarling open to reveal his triangular tearing teeth. Riding on his back, in a saddlelike harness was another male of Dr. Boon's race and a spiney ball body of a Communicator with his rods erected to radiate in the frequencies used by the three races.

Dr. Boon whirled on one corner and stalked straight at the Runner. He lost his temper. He yelled, "Get out! Out! This is a medical examining room. Get out, you mad men! Privacy! I claim Privacy! Get out! Get out!"

The Runner raised one front paw and opened his mouth.

Jme's voice commanded, "Staph! Hold him!"

The being in the saddle was evidently Staph, because he said, "Easy, Msee." The big Runner put his paw down.

Dr. Boon half turned to Jme and snapped, "Now, get them out of my examining room. That door was *locked.*"

Staph said, "Doctor, there is a planetary emergency and I am instructed by the Central Government to find the Habitat Manager, Jme. I have authority to open doors."

Boon raved at him, "No being has the authority to open locked doors. That is my right of Privacy. More, young idiot, it is my patient's right to professional privacy. You ought to be back in a creche. Nobody has that right."

Jme moved to touch him, calm him. She said softly, "Dr. Boon. *I* have that right."

"What?"

"Two weeks ago, Doctor, we thought this planet was going to be severely damaged by a projectile from the inner planet. We, the Central Government and I, were forced to evacuate nearly one third of our



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population from what we believed was the danger area.

"You didn't hear about this, because the projectile turned out to be a scientific instrument carrier and it soft landed. Soft landed almost on top of me, I might add, which seems to have triggered my present degree of personal survival.

"Well, no matter. That instrument package, that lander, failed to work. Its power supply did not function and it sits in a crater twenty kilometers east of here. The scientist capable of sending one such lander would be expected to send another. And so he did. Ten days ago the astronomers on Timor detected the firing of another projectile. It is evidently about to arrive, or they wouldn't have sent Staph after me.

"You see, dear Doctor, there is an emergency and your door is not really very important. Oh, Boon, they wouldn't have sent Staph after me without some authority."

Staph explained. "She's right, Doctor. She is the Habitat Manager. In any habitat emergency, the Central Government has given her the command of all life forms, anywhere. We didn't come through the door before, out of respect for *her* Privacy, not yours." He ignored the doctor and turned to speak directly to Jme.

"Manager Jme, you are called. Your summary was correct. The second projectile from the inner planet is definitely on the way in. It is nearing the moons now."

She asked, "What is its trajectory?"

Staph handed her a card and said. "The Moon astronomers are only making quesses, so far, but the assumption is that it will orbit and impact in the same area as the first one."

Jme signified agreement. "That appeared to be the inner planet scientist's plan when the projectile was launched from there ten days ago."

Staph agreed. "Apparently. Both trajectories will be plotted on the charts at Operations. In any case, we are ready. The ecological displacement is virtually complete. The working ground path was a strip eighty kilometers on each side of the first lander's course, as before. This gives us a good Sigma margin on the lander's volume of uncertainty.

"The ground path is clear of any object that would show from the fifteen-mile pass. All the small mobiles have been ordered to den-up, or stop moving, for the two days. There may be some loss of life here, Jme, if the food supplies fail. I've got several teams ready to go out on that as soon as the lander is down.

All of the Trees are down underground. Bushes and the larger Mosses were also asked to go subsurface and we are feeding them through the root network. The Mosses grumble about the minerals, but they'll live.

"There's one thing, Jme. I can't conceal the Tree bores or the habitat potholes where those forestations



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were. It just isn't possible to put ground scrapers all around the planet. They're going to be visible, probably out to two diameters. I expect they will show as very small craters. We might ask the Moon astronomers for some holograms, to check.

"The other big problem is the Grazers. They are hard to stop when they move and harder to feed when they stop. The diversionary plant growths I've had to order have changed the traditional cycles in many places. Also, I've lost a herd in a wind storm, east of here. The Runners working with it got lost in the sand. We will be a long time fixing this up."

"Life security, Staph. File it for now." Jme's mind was flashing along some of the details of the job. Staph and his team had virtually relocated part of the planetary life cycle. The task was one of fantastic detail. She would have to get to the Operations map room soon, before the details got out of scope. She instructed, "Have the Advisers meet me in the crater Operations Center. I will work from there, right from the beginning. You can stay in the Center, or finish up with the underground crater coordination. Just be where I can contact you."

Staph said, "The Advisers are there now, H.M. I intend to stay in the surface tunnels. There is a lot of detail to finish. Will you come with me, now?"

Dr. Boon answered that positively, "She will *not!* I am still examining her. You've delivered your message, now get out of my surgery."

Jme said, "Give me fifteen minutes, Staph. I will take the tube. You go on ahead and set up the Operations Center. I will want to see the astronomical data displayed as well as the biotopes for the displaced areas, please."

The two in the doorway hesitated. The Runner looked around for something else to break.

Jme said, "That's an order, Staph. Msee!"

The Runner whirled and bounded out of the room.

Dr. Boon let the relief show in his voice, "Those Runners are big. All teeth and legs." An idea flashed across his mind. "You are not planning to ride around on one of those brutes, are you? I forbid it!"

Jme laughed lightly. She said, "No. I won't, Doctor. Staph is the only one so far who likes to move that fast, and Msee is the only Runner who will ride him."

"It's an odd symbiosis."

"Just a partnership, Doctor. A symbiosis *would* be in my field, but their relation is not that sophisticated. Staph and Msee are just friends.

"Now, back to me, please. Will you finish your examination, so I can go back on duty."

"I finished it, my dear. You are completely healthy. Don't worry



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about the reproduction. That will be healthy, too."

"My only worry is the time and my work. How long can I stay active, Doctor? How long before . . .?"

"I can't say, Jme. Four hours to three days . . . very soon now. You will apparently be working underground, true?" She signaled an affirmative and he went on, to himself, more than to her. "Artifical light will give lower energy . . . the longer time, maybe. But you will undoubtedly be under stress and working at a high pitch. That will increase your activity. It could come sooner.

"I don't know, Jme."

She said, "A fine doctor you are, Boon. Plus or minus three days. So much for science."

Dr. Boon had an epigram for that. He said, "Medicine is the science of curing sickness. What you've got, Jme is not a sickness. Besides becoming gametic only relieves the symptoms."

"A very old joke, dear Dr. Boon. Perhaps I deserve it. Only with this emergency and all, it's a bad time. Awkward."

He soothed, "I know it, Jme. Take it easy. Let your assistants do the work. Be a manager. Just direct.

"Let me get serious for a minute, then you can go. You will be completely normal, mentally . . . thoughts clear. They may even seem brilliant. That's the energy level storage build-up and the excess chromatin your body is building and it's definitely normal.

"There may be some periods of disorientation—you may notice double vision, fuzzy frequency control, or you will just concentrate on one object; things like that. They will be very brief, and you should have no lack of control. Just watch for them.

"There will be a period of pain at the beginning, of course. When this happens, Jme, you must relieve yourself of duty and get medical help. You are about one hour away, then, and physical mitosis is rapid after that. Believe me, my dear, nothing, not even a planetary emergency, will matter at that point. Your body will take over . . . you understand?"

Jme said, "I understand." Then she asked, more hesitantly. "Dr. Boon? Will you be that . . . medical help? Come to the Operations Center and just . . . be there? I . . . I . . . I will be very efficient and precise and never notice you while I work, but I would like an old friend close . . ."

His voice was gruff, "Of course. Do I have to break down the door to get in?"

She laughed, "No, this will be business, not pleasure."

"Then get out of here and let me clean up this mess. I'll be there. Leave my name at the gate."

Jme said, "Thank you, Dr. Boon." She turned away and quickly walked out the broken door.

She hurried to the end of the hall



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to board the transport tube directly to the crater Operations Center. A good part of the fifteen minutes she had promised Staph had already passed. As she left the office Jme left her medical worries behind her. They would intrude fast enough, in the meantime she began to consider the details Staph had left to finish.

Her mind reverted momentarily, when she discovered that she was wider than the tube transport shell and was forced to curl up uncomfortably in its cylinder to close the cabin lid. However, her body accommodated and she forced her outraged female mind back onto thoughts of the ecological problems and things that might yet go wrong. She worked on solutions as the transport slid through its tube to the interchange and out to the domed room under the crater floor; Operations Center.

When she entered the Center's map room, her training led her to check the furnishings and atmosphere. By experience, almost instinctively, she knew the ecology was not in balance. What was it? In so small a living unit, this single room, the reason would be something simple, uncomplicated. What was it?

She checked the maps and display boards. They filled half the room and a group of mobile communications assistants were marking them in fluorescents to show the situation. A star chart showed the predicted orbit path and the present position of the incoming vehicle. A curved hemisphere displayed the ground path of the orbit from the local horizon to the impact point and a stylized strip chart showed the entire ground area under the lander's orbit, clear around the planet. Mounted in the air above, was a giant globe of the whole planet, where the ecological data could be summarized. The ecological displacement was going on simultaneously all around the planet. The task was one of fantastic detail and only the continuous charting and recharting of the map crews let Jme and her Advisers keep track of any of it.

The display map crew was working normally. Operational notes were being added to the charts in symbols, even as she watched.

The room life support panel was carrying normal operating mode signals for all five types of life forms present in the room and the indicators showed there was food and drink available, with stimulants or depressives, as might be required. She knew that panel would be fully operational, because Staph was not in the Center. He would never have left with a mechanical imbalance in the environment. There must be something else.

She glanced at the raised platform that had been built for the Advisers and scanned it quickly. The Adviser for the Tree and Bush people was placed in his mobile root tub under the high energy light cone he required. He seemed satisfied, except that the few leaves he had extruded



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from his limbs were quivering nervously. The Adviser for the Communicators was also apparently comfortable, although Jme suspected that he would rather be running the map communications net than looking at it. He was curled tightly in a ball with the jointed tubes of his communication rods folded tightly to his body—a position of rest. The Advisers for the Bacteria and Micros were present in their shielded pressurized globe. They presented a milky blue swirl to the outside world, that was really the nutrient fluid of the several hundred collective colonies of Bacteria that made up the Advisers. Jme's instruments said they were in good health.

The Runner . . . Ahh! That was it. The Adviser for the Runners. The huge red-brown body was crouched on the observing platform which had been built for him, but he was not relaxed. All of his muscles were in tension, and he was *hot.* Jme had seen the color change from rusty brown to this red color before. The Runner was radiating heat. She shifted her sensors to the infrared range to verify this. The Runner was a glowing shape of heat. The path of cold conditioned air above his station was flowing at full volume. In fact it was causing a considerable cold air circulation over toward the Tree Adviser's tub. Jme changed the frequency response of her sensors to the cold temperature range and the whole air movement of the room became *visible* to her. It was rapidly deteriorating.

She crossed quickly toward the Runner and went back to visual perception. The Runner himself was producing the heat as an emotional reaction; probably to being in this confined room. She would have to get him calmed down, if possible.

As she drew closer she suddenly recognized the shape of his ears, certain scar patterns, and realized that she knew this Runner from a previous time. He had helped her in a job of locating and transferring several thousand small mobile life forms to a better food area.

She said, "I recognize you, now. You are, Utoo. I am Jme. Remember the little fur crawlers?"

He said, "I remember. I still do not like to look on those little . . ." His voice was a harsh purr. "I remember you also, friend Jme."

She went closer to him and bent one corner over to rub it up and down against his forepaw. This was as high as she could reach and as close as she could come to the Runner method of greeting friends. They rubbed shoulders. She was rewarded by the deep rumbling noise the Runners use on such occasions and a noticeable drop in the temperature as the laboring air-conditioner overcame the Runner's body heat.

She said, "I'm glad we can work together again, Utoo, although I am sorry that I must ask you to stay inside a building and to lie still, but that is the nature of the work. I won't



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ask you to run for me this time, so you may relax completely. If you need anything, please ask the Communicator units for it."

Utoo did relax, suddenly. His paws drooped over the edge of the low resting platform like they had been broken. He said, "I do not need anything, thank you. I have eaten before coming to avoid embarrassment." Runners were carnivores and their twin rows of triangular teeth made their feeding periods . . . uncomfortable, for other races.

Jme said, "That was kind, old friend, but unnecessary. Privacy screens are available. If you hunger, do not deprive yourself."

She touched his paw once more and then walked to her own raised platform and mounted it. She noticed briefly that the Runner's temperature was nearly down to the general room background and then she turned to look at the map display.

She said, "Utoo, I've called the Runners in out of the High Deserts to help move and turn the migrating Grazer herds.

"Will you fluoresce the Grazer coordination on the strip maps, Tubes, please?"

The map lit up as the Communicator in charge, Sprkss, radiated control frequencies at the luminous fungus placed on the giant map.

Utoo said, "There are more than a thousand Runners working the herds, Manager."

Jme saw that all the arrows on the map curved away from the evacuation belt. She said, "The herds will have to be diverted into large circular migration paths or they will overeat the food supply."

Utoo said, "That is being done and will continue. One of the herds is passing near the impact area, now; coming in from the High Desert. The Grazers will be hurried."

"Is that the herd Staph reported as lost?"

Utoo nodded, "They are running in the wind. The storm is blowing away from the impact area. They will be located."

Jme said, "Very well." She turned to the Adviser for the Tree and Bush people. "Have you experienced any difficulty relocating the Tree population, Adviser?"

One of the comm-rod units in her podium began to radiate as a Communicator translated the quivery leaf vibration of the Tree Adviser's *voice.* Jme interrupted. She said, "Adviser, please. I want to record this briefing. Will you utilize my translators and speak audibly at this frequency." She indicated a glass booth at one side of the working section of the room. Several spiney Communicators were in this booth, their comm-rods erected in readiness.

The Tree Adviser began again. The translator gave him a slow whispery voice that matched his size and the leaf vibrations he produced. He said, "I am the Adviser Entne. I know your translators, Manager. They will speak with my voice.



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"Whole forests are retracting underground. Bushes and Trees are retreating from valleys they do not leave even when the great carbonic clouds come down the winds. We fold our leaves and sink into foul tasting food-pots." He wrapped the leaves on three of his branches tight against the branch, snapped the branch up against his trunk and slid his rings one inside the other to reduce his height. He telescoped down, then back up again, erecting his leaves to catch the energy of the overhead artificial lights.

"We feed from chemicals poured into the root channels and crowd the soil of other forests. Is this needful, Manager? Who will take care of our home forest soil while we hide beneath the permafrost like seed pods?"

Jme explained, "The lander will be here today. By tomorrow, or the next day, I will start returning your forests."

Entne had a further objection, "The planet has turned, Manager. Forests on the equator are deep in winter night. And at the poles . . . Look, your own charts show the great carbonic clouds you have set free. They are twenty to thirty kilometers farther from the poles than the longest recorded summer. Trees will die if they return to those valleys with the heat and carbonic wind."

Jme said patiently. "Adviser Entne, we will not do that sort of returning. You are here to advise for just such matters. The polar caps were heated to save lives not to kill Trees.

"When the Tree and Bush populations left the polar valleys, the surface soil changed. The nitrogen-to-nutrient ratio went to pieces and the temperature dropped.

"The nutrients can be balanced by injection up through the permafrost, but I had to bring the $Co_2$ clouds from the poles to make a reflective thermal barrier. I need to protect the Bacteria and Micro populations in some soils. I personally know of two stanno-thermal colony areas. There are many others." She swung back to Sprkss at the map console. "Sprkss, what is the polar cloud plot? Let's see it for the North first, Tubes."

The patterns of fluorescence shifted for a minute on the versatile map and then a frosty silver glow began to develop around the polar cap. Jme grinned inwardly at Sprkss choice of colors.

She watched the cloudy movement of the polar air as it developed on the map model. Fingers of silver flowed down across the northern valleys in a premature summer. Fine water sprays from hurriedly converted communication tunnels made convective swirls of air and guided the clouds across the landscape to cover the evacuated forest areas. Under the blanket of reflective gas the greenhouse effect built up the temperatures. With the rising temperature the soil Bacteria, Virus, and Micro colonies continued their vital



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task of converting the soil to air and the air to nutrient in the ageless primary task that kept the planet alive.

A translator's voice said, "Manager, I speak for the Adviser of the Bacteria colonies. He says, 'Manager, we are the Speaker.' "

Jme asked, "Is that all?" She turned to Sprkss. "Does he have a good link, Tubes?"

Sprkss said, "They are very hard to talk to. I get a multiple signal, of course, and I have to link in a translator for any other life form . . . You should be able to talk directly, H.M. The translator is linked."

The translator radiated again. He gave the Adviser's voice a slight double-echo quality. Bacteria colonies always spoke collectively. They said, "Manager, we are the Speaker. You are viewing the work of our Ancestors on your map device. May we ask, is the work done as you wish?"

Jme sought for quick phrases to answer. The efforts of a whole colony of Bacteria were required to generate the vibrations that the translator picked up and amplified. The senders would live and die, before she replied. If she delayed, generations might pass within the Adviser's globe and her answer would be meaningless.

She said, "That effort went well, Speaker. Those Bacteria colonies were a corner I did not want to cut. You can't move a Bacteria/Micro population. Oh, I could have relocated all of the area by selective sampling and growing new sibling colonies. They could have taken along the records and memories of their ancestors; their life would continue, but the old generations would die where they were born.

"Your race is important to our planet, Adviser. I'm glad the cloud effort helped. Your work was well done. Have I answered?"

The Adviser said, "We are the Speaker. Yes, my ancestors thank you, the question was answered. We are fortunate that you are sensitive to our life problems, Manager. Your summary was exceedingly exact. There were deaths-before-time, but the generations were recorded and the wisdom passed on as is needful. Your gift of warmth helped. We will record and watch in silent generations until you need our services."

Jme's mind swam with a sudden realization of despair. All of the evacuation was planned for no deaths, no losses of live, but she had forgotten these millions upon millions of Micros. These beings would die; were dying. There was nothing she could do about it.

She said. "Data, Sprkss. How many died?"

Sprkss said. "We don't know. Here is the math curve. Screen Two."

Jme stared at the display. Her sensitivity to life made a sickness rise in her. So many. She swayed on the platform. Oh, something *more* had to be said.

She called, "Speaker. Speaker. I am sorry that your life form could



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not be removed from the orbit area. There will be more deaths at the impact point, too, Speaker. We cannot remove . . . You know I cannot do such a task, even though in my love I would want to. I cannot remove Bacteria and Micros from the soil, Speaker. In our language, Speaker, *sterilization* means death for your colonies and generations. Oh, believe me, Speaker, I would never order such genocide, even if I could do it physically."

The Speaker said, "We are the Speaker. Do not regret. You are the Manager. We have been told by our ancestors that there will be loss of life at the impact point, from the heat and your preparations. We accept that. Those who die will be mourned and remembered. It is a high honor. I may speak no more for a time."

Jme shuddered. She wondered what it would be like to be the spokesman for a life form that lived and died so fast. She had seen the math on their deaths-per-second. For a planetary bacteria population it was on the low-normal side, but it was still a very big number.

The Adviser for the Communicators waved his frequency rods for attention and radiated in his own voice. "We are all complying with the planned directives, Manager. Your organization is able and most of our species, or families, are on the way out of your designated area. That still does not fully explain the haste of your emergency. Could you clear this up, please?"

Jme answered him. She said, "Adviser Cybnd seeks to get me back on the main line of work by asking a question for which he already has the answer. Sound psychology, Cybnd, thank you.

"Outside of the fact that we knew from the beginning that there was a ten-day deadline before the second vehicle arrived, I ordered the speed-up because of some very unique aspects of this second vehicle. Adviser Cybnd, as head of our very new Department of Astrobiology, has a coordination of the data. I'd like him to present that now.

"Adviser, please?"

Cybnd erected two more rods and said, "Very well, Manager. If you can spare the first screen on the data display, Sprkss . . . ?" Sprkss could, and it went blank, then began displaying charts to back up Cybnd as he talked.

He said, "The Astrobiology Department was formed to handle communications with our neighbors on the inner moon, Timor. They contacted us as a matter of routine, when the first vehicle came in, and aided greatly in plotting its orbit and studying its approach.

"My coordination in regards to this second vehicles was a simple one, compared to a difficulty such as an elementary ecological balance, Manager, but it showed one amazing fact. Repeatability. The second vehicle is the same as the first.



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"The incoming vehicle, the second one, is now on a collision course for our planet. This course is identical with the path of the first vehicle. Because of this repeatability, we conclude that the second vehicle is identical to the first. It was launched from the same spot on the planet, within a mile, and almost exactly on the same point in the planet's diurnal rotation. That alone is an incredible feat of astronomy."

Utoo asked, "How do you know it is the same type of device?" His race was very direct.

Cybnd said, "I don't, of course. However, the fact that the second vehicle was launched right after the failure of the first argues that no time was spent on analysis and that a duplicate lander was sent. The logic is for repeatability, and, if the indicated points of similarity hold out, as they have so far, I will work on the assumption of repeatability. What else would you expect such a Scientist to do?"

Utoo said, "Nothing less, I guess. I was going to suggest you check your theory as you went along, but you seem to be doing that."

Cybnd said, "I am correlating the data as it comes in, but thank you for the thought. The landing device *might* be different. I do not think so, however. The Scientist would be able to tell that his lander had suffered a power failure, I think, and not something requiring a design change. The timing of the second shot also seems to indicate this.

"Now, where was I. . . . Curve three? Yes, well, in this plot, we made some preliminary assumptions. With the vehicle's rockets firing at the same time as the first vehicle, it will orbit, so, and the lander, detaching at this point in the equations, will impact within yards of the first lander.

"We do not think that these assumptions are unfounded. We consider the coincidence of landing points an example of incredible, marvelous repeatability on the part of The Scientist who designed this experiment. Astrobiology bows to a fellow scientist who plans his experiments so precisely. We have given him, as you may have noticed, the honorary title of *The Scientist.*"

Jme broke in, "Yes, thank you, Cybnd. Well, Advisers, it is precisely that repeatability on the part of The Scientist that caused my ecological alert and speed up. Instead of passively waiting for this vehicle to come in and land, we, the Central Government, and I, have decided to do everything in our power to help this magnificent Scientist from the inner planet to complete his experiment successfully. In addition to the safety policy of removing all major life forms from the orbit area, we are implementing an active policy of aid, planetary aid, to this Scientist.

"As you know the first vehicle landed, but its power systems failed. It crashed and did not return any data to its builder. Gentlemen, in ten



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days we were able to examine the crashed vehicle and discover that it was an amazing mechanical device to collect specimens of our world. We have fully analyzed its operation and are prepared to assist the second lander in every way. Staph is up above us now with a crew of trained mobiles who will be able to provide the exact sample required by each type of experiment on the second lander. He has planned to do this without introducing a single disturbing factor into The Scientist's experiment. He will work from under the permafrost and the lander will collect only those samples it has been designed to collect. Thus we will aid and help The Scientist with his great two-planet experiment, while at the same time marveling at the genius of a being who could design the mechanisms of such a giant inter-planet effort. In any event, Advisers, we have had ten days to get this plan into effect and we expect it to succeed.

"We expect the second landing to occur here, in the crater, and our greatest effort is concentrated here. We do have other teams located at probable landing spots around the orbit path and will rush all possible aid to support them, if it becomes obvious that the lander will set down somewhere else.

"The speed up of the ecological displacement . . . the extra time which you have given us has been devoted to getting the details of this support ready. You have given us the time, Advisers, and we will be ready. This experiment of The Scientist of the inner planet must not fail. To this we are dedicated."

The voice of Sprkss, the Communicator operating the map displays, interrupted her. His words were carried to all the Advisers on an open translation. He announced, "Manager, I have a lasar recording from the Moon astronomers."

Jme said, "Transmit it, Sprkss."

Sprkss said, "Astronomer Minon reporting. Message begins: 'Have checked the predicted orbital ground track during 1045:10 transit. 40X magnification. No visibles. Your ecological evacuation complete. Holograms covering impact local horizon section squirt xmitted on 2445:10 transit your horizon.' Message ends."

Jme acknowledged. "Very well. Transmit to them please: *What is your report on the vehicle? H.M.* And Sprkss, will you translate his codes, please?"

They both waited for the brief message lag, then Sprkss read out the coded light modulations he was monitoring.

"Astronomer Minon reporting: Message begins: 'We are realigning, now. The vehicle is calculated at one minute to rocket firing time—if it is going to make the same orbit as before. Telescopes are now aligned. Hold.' " After a short wait he continued, leaving out the salutation. " 'The vehicle has fired its rockets. We are computing. The firing has



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stopped. Here are the results. The orbit is stable. Astronomer Dunro reports the firing was exactly at the predicted time. The ground track should be the same as before. He will know in fifteen minutes, but by then the vehicle will be over his horizon. It should appear over your local horizon in one hour, your planetary local time system.' He also says personal to H.M.: 'Repeatability, marvelous.' Message ends."

Jme said. "Thank you, Sprkss. Keep a channel open to them, please. I want to verify the ground track as soon as they can plot it for us. Our theory is coming along nicely."

She turned to face the vision screen which was set to communicate with Staph's tunnel headquarters. She said, "Staph, the ship is in orbit. Can you give me a summary of the crater work?"

Staph came on the vision screen. His sensors darkened in embarrassment. He said, "That will be close, H.M. I've stopped all work up there for now, while we get all the visibles out of the way for the first orbit pass. The ground is almost ready, but we've got a couple of other hot problems."

Jme said, "Staph, that ground has got to be just exactly, precisely, as it was when the lander came down the first time."

"I don't see how the ground got so pounded in just ten days, or where all this equipment came from. We must have had every scientist on the planet out there."

Entne's voice registered a chuckle. He said, "Except the Trees and the Lesser Mosses."

Jme asked, "Sprkss, do you have visual circuits out to the crater, yet?"

"Yes, the center screen."

"Well, turn it on. Turn it on. Let's watch something else besides these maps."

The large center screen which hadn't been used up to now, began to light up from right to left. Above in the crater wall, a bank of light-collecting filaments were pointed at the impact area. The Communicator, Sprkss, uncovered the lenses on their filament ends in succession, so he could check for defects, or missing filaments. When they were all uncapped, the visible light from the scene was channeled down the filaments to the screen surface and was visible to the Advisers. The effect was a larger-than-life picture of the crater with the first-lander sitting in the left-hand corner. One of its solar panels was deployed, like an ugly mobile with one wing broken.

There was still much activity at the site—too much, considering how close the orbiting vehicle was. Jme could see Trees and some Bushes that were part of Staph's ecological team.

She snapped, "Staph, get those beings out of there! That orbiter moves fast!"

The four Trees were sinking down into the ground. Their ring sections



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slid inside each other as the branches folded against the trunk, the leaves turned white-gray to conserve heat and tucked against the branches: The tops of the branches telescoped into the ground and they were gone.

The Bushes were spread out a bit more and they writhed around in patterns as they shrank in area and then pulled themselves below the surface to wait out the landing.

Four groups of mobiles began pulling a frame around, smoothing the soil, removing footprints, tracks, and making the crater surface look rough and natural.

Suddenly there was a lot of noise and much excited yelling. Sprkss had managed to activate some sound detectors in the thin air of the crater. Three Runners went dashing across the crater. One of them was carrying Staph on his back. That would be Msee.

Utoo said, "It's a herd of Grazers, moving right toward the impact site." His eyes, skilled at seeing such things had caught the movements in the screen. "Looks like they outran the sandstorm. Well, they aren't lost now."

Entne said, "Didn't they get the word. They should be moving off the other way."

Jme said tensely. "He's got to get them out of there. The area has got to be clear for the first orbit pass."

Utoo said, "Staph will do it. He's got Msee to help. Look, they've got the leader of the herd, now."

Jme asked, "Communications, can you get a detector over there?"

"Checking."

Jme hurried him. "Come on, Tubes. In ten days that whole crater has been honeycombed with your detector net. Get one working."

Sprkss' voice was calm. "Yes. I found one. Network linking up, now. No. No time. Watch the screen."

To the right of the group of Runners and Grazers a brilliant point of light sprang into being and began to modulate. Sprkss had linked a light unit into his detector and was sending the conversation verbatim. He switched to another group of visuals and ran the magnification ut in order to bring the figures in close.

A translator began reading the light signal from the smaller screen, using Staph's voice, Msee's purr and giving the Grazer a high-pitched squeak that had a comedy effect.

Staph said, "You must turn your herd and run. This area is being cleared."

The Grazer said, "No land is cleared ahead of my herd. We have always grazed here. We are fleeing a great storm. It blinds our young."

Msee growled, "No time to argue, Staph. Let me run them. I haven't eaten a Grazer in months."

The Grazer bleated, "This is not an eating matter. We are changing grazing grounds. The law protects . . . You can't eat a whole herd."

Msee said, "No, but I, and my friends here, can kill the first five that move toward the crater." At that



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he rose up on his hind feet and opened his forearms and mouth at the same time. "I will eat the first one. Will that be you, succulent one. Your ears look fat and juicy."

In the Operations Center, Utoo chuckled deep in his throat.

The Grazer said, "You can't kill without food need. It's a crime." He bounced on his feet in alarm.

Msee went on—Staph was letting him do the talking— "We have the authority of the Habitat Manager, Delicious Nose. I can eat you if I like. This is a planet-wide ecological shift and you are in the way. Besides it will be fun." He opened his teeth and howled. The translator didn't trouble to translate the howl. He didn't have to.

The Grazer whirled and stampeded into his herd. The herd picked up his panic and twisted off away across the plain. Six Runners came up with the flanks of the herd. They were part of the detachment that had lost contact in the storm. They spoke briefly to Msee and went off with the herd.

The swift movement of the Runners caused Jme's vision sensors to whirl and she leaned against her podium to catch her balance. Then her senses were blanked by a rippling pulse of pain. It stabbed across her back twice and then was gone, leaving her shaken and clinging to the podium to keep from falling. She had missed part of Sprkss' announcement. He was saying, ". . . Orbiter is one minute from our horizon. This is a standby warning!"

A voice from Staph's area came over the comm-unit at a loud volume. "Everybody inside and freeze!" Get that Dragger out of sight!"

Jme forced her voice out in low tones. She said, "Calm down up there in the tunnels. Follow Staph's instructions."

A warning light flashed.

Sprkss announced, "Here it comes." Then, speaking to his remote detector crews, he ordered, "Visual only, now. Don't hit it with any radiation."

The orbiter flashed into view as a pale light spot in the vision screen and stayed centered as the outside optic rods moved swiftly to track it. As it went overhead, the picture wavered a bit, a new bundle was taking over the tracking, then steadied down and the orbiter fell away over the horizon.

Jme said, "All right, Staph. Get at it. I want that ground just exactly the way it was when the first orbiter landed." She glanced at the plotting chart. "The orbit elements were exactly the same, Staph. The impact predictor has zeroed in on the crater. Get going!"

Staph's voice came out of a speaker. He said, "The ground is almost right, now, H.M. We want three or four more passes with the pulverizers to get the sand grain size down and the density distribution spread out a little more."

"Good, Staph. I want the ground just exactly . . ." Jme realized she



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was repeating instructions and broke off. She left him to do his work and tried to relax. Her body was tense and tended to stand straight and flat. She gripped the edge of the platform with the corners of her lower edge and realized that she was now wider than the platform. Dr. Boon was right, her body did seem to be taking things into its own hands. Well, she would last. She had to!

Desperately she took her mind away from that line of thought and began following the tracking reports around the planet, as Sprkss marked them on the big map. The orbiter and the lander units separated and the lander began its descent trajectory. The little red triangle indicating the firing of it's retro-rockets was exactly in the yellow circle of the predicted firing point.

Staph reported his, *all ready and all life clear,* minutes before the orbiter-lander combination came over the horizon. The lander was detectably lower. It fired more rockets and began to slow. Then it came into the atmosphere and the detectors that were recording the long heat wave lengths from the retro-rockets began showing a steady temperature rise and helping to track the path. In minutes the lander was down low enough for the crater visuals to see and the screen gave them a picture of the flat, boxy, lander hanging under the bright curved domes of its fluttering air brakes.

Jme was relieved at the sight. Her nerves were tired of reading and interpreting the charts. The visual picture was reassuring. She watched the lander come down the sky. It moved swiftly to a point just above the hills where, *the air brakes blew away and fluttered in the sky.*

Jme's vision doubled. She seemed to see two sets of the fluttering brilliant brakes. At the same time her attention was fixed on the falling lander. The experiment had failed again. It was going to crash!

Her energy intake slowed, then pulsed rapidly, then slowed again. She was only dimly aware of the Adviser's chatter around her.

"It's broken!"

"No, there, the motor fired. See the flame?"

"Did those air brakes stay with it last time?"

"Yes, right down to the ground."

"Maybe that's why the first one crashed."

"Look, there's one of its legs!" Jme recognized Utoo's loud voice.

Sprkss' voice came through. He said, "The flame is melting the ground. I've lost my heat sensors. We are recording from the crater wall, now, H.M."

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Jme changed frequencies on her visual receptors. The doubling images swam together into single one, just as the lander's motor cut off. The lander went forward a little and another air brake ejected to lower it to the ground. It hit and the legs deflected to take up the shock.

The ring and cables just above the lander separated with a flurry of motion and shot up through the air brake, carrying it out and away from the lander. The sudden violent movement brought Jme back to her alert sensing. She saw the projected crater floor now in very clear bright colors.

She asked, "What was that? Did you record it, Sprkss?"

"A helix of metal, compressed to store energy and released. See it is still vibrating."

Utoo reported, "It shot a projectile into the air brake and carried it clear of the lander. Ingenious! It was operated on purpose.

Cybnd said, "That didn't operate on the first lander."

Jme said, "No, and it didn't operate when we were inspecting and analyzing the lander either. If it had, somebody would have lost a head.

"Well, no matter. The lander is down and The Scientist should begin his research program any time now. Staph are your units positioned?"

"Almost perfect, H.M. The heat is radiating away and I have a tunnel complex almost directly under it. We are extending the tunnels and detector bores up to the surface, now."

"Good. Stand by. I don't know which experiment will come first."

From the top of the lander a square rod erected itself, then another. The third movement was a dome-shaped turret with a flat side. This gave off a wink of light.

"Laser!"

Jme asked, "Sprkss, anything?"

Sprkss replied, "Just reflection, Jme. Overloaded an optic."

Jme said, "No. I mean, did a signal come in to start this?"

"Oh, I understand. No, nothing detected."

"Then this is all automatic. Good. That should speed things up."

Adviser Entne asked, "What do you mean, Manager?"

Jme turned to face him. "Transmission lag, Adviser. If The Scientist had designed this so that he had to start and stop every experiment with a signal of some kind, the transmissions would take four hundred seconds to the inner planet; eight hundred seconds plus analysis time all told. We would be here for months. As it is the lander seems to be working on an automatic program of some sort. We suspected as much.

"What are those rods, Sprkss? Got them figured out yet?"

Sprkss said, "They're optics, H.M. The rods are coated for light reflection and they are turning slowly. The Scientist is using a light lever system to see around the lander."

"Visual light?"



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"So we believe. We noted these rods on the first lander. I don't think they can handle any other frequencies; although low red and medium high blue are possible."

"What can it see?"

Sprkss said, "Estimating, now, H.M." A diagram appeared on one of the auxiliary chart boards. Sprkss explained. "Studying the triangle of the rods and dome, and assuming all three move through these small arcs, I'd say The Scientist can see three hundred sixty degrees. The detector in the dome of the lander sees everything in front of it, plus whatever is reflected from the rods. Yes, it ought to get the whole horizon from the level of the top of the lander. It can't look up or down.

"I have units duplicating the arrangement for a precise answer, but the experiment will be over before . . . yes, there, the rods have stopped moving. The Scientist has had his look around and shut off the system, I'd guess."

Adviser Cybnd was curious. He asked, "Why not continuous vision?"

"Limited power, Adviser. Continuous vision would only be valuable if The Scientist were looking at the scene directly. He is not. That lander is not radiating anything but low grade heat.

"Excuse me, here comes the next experiment!"

A third rod was lifting up from the top of the lander. On top of this rod was a round, flat plate, curved in at its center. Unconsciously Jme formed the same shape with the curve of her back. She felt the energy level of the center of her back go up to an exciting level, then she straightened and the sensation was gone.

Cybnd was unfolding more of his rods to watch this experiment more closely. He said warningly, "That may be a radiator, Sprkss. Tap it!"

Sprkss got busy. He said, "Right! But it won't be radiating light. Not if it's going to try to reach The Scientist, himself . . . high frequency receptors! Quick! Very high; very short . . . there!

"No, not right. Missed it."

Utoo asked quickly, "What happened?"

Sprkss said, "It sent out a very short wave of a tremendous frequency. I had some receptors that were short enough to vibrate in harmony, but the frequency was too high. No communication, Jme, sorry. There were deaths in my receptors."

Cybnd asked, "Can you replace them? I will help . . ."

Sprkss said, "I can replace them. I will bring up some high-frequency units, but they are sensitive and it will take time.

"The signal was Intelligence, however. H.M. It was modulated on two levels, almost pulsed. Also the time of sending was just as long as the visual observation period."

Utoo said, "The Scientist did get his look around sent back to him, then."

Jme said, "Yes, and he may have sent a signal for the next experiment.



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With Sprkss' detectors out we couldn't tell. Our theory of an automatic experiment package doesn't look too good, right now.

"I want to follow this from the surface tunnels. Tell Staph that I'm coming up." She left, before anyone could stop her.

The lift and transporter above the Operations Center took her to Staph's tunnels just under the permafrost. They were crude bores. He hadn't wasted any time on them. She glanced at the roof. Staph had thrown up supports for the life-support lamps and the tubes of the comm-units, but the roof was unfinished. In places it was hollowed away to expose the permafrost. She didn't like the tunnel. She adjusted her body energy input to compensate for the cold and hurried along to Staph's working area.

Staph was up ahead where the tunnel branched. He had set up a comm-panel with two fair-sized vision screens and a crew of working Communicators. She heard him say, "Sprkss, get your detectors in position and record the next signal. I suspect that each experiment will be followed by such a signal." From the sound of his voice she was able to find him. He was almost out of sight up in a Tree bore that led up to the surface. The lander must be directly overhead.

Adviser Entne exclaimed, "Of course, The Scientist *would* check the results of each step. He is a most precise person." His voice was clear and distinct. The Communicator on the comm-panel mimicked it perfectly.

Staph came down out of the Tree bore and saw Jme. He said, "You are in time, Jme. There is an experiment beginning. This is one we have been expecting."

They looked at the vision screen in time to see a long rod begin to extend from the side of the lander.

Jme said, "Ah, that is the soil scoop. We were able to get that to work. It extends straight out and the bucket locks down. Then the rod retracts. The bucket digs a trench and fills with soil . . . There the bucket has locked down."

Cybnd's voice asked. "Will it get a good sample?"

Staph answered, "Absolutely. We have analyzed the scoop mechanism and the soil consistency is just right. The scoop will fill completely in the length of its dig and it will leave a clean, uniform trench, with sides exactly at the angle of repose for the soil density. It will work exactly as designed. I guarantee it."

The bucket tip dug into the soil and scraped its trench easily and smoothly. The soil crumbled into the bucket, leaving a trench about a meter long.

Utoo's rattley purr came over the comm-unit. He said, "A very neat job. No waste motion."

Jme nodded. "The soil density was exactly right, Staph."

Staph said, "Nothing, really. The design of The Scientist's experiment



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made it obvious what he wanted. H.M., what experiment do you expect next?"

Jme said, "I don't know. There are only a few experiments on the lander. The soil sample is going to be taken inside and separated into small samples and dissolved in various chemicals. All of this is done by an intricate machine, and the data will either be stored, or transmitted, by one of those high-frequency pulses. In any case, I don't think anything will start until that process is over."

Adviser Entne wanted to know, "Can a machine be made to analyze the soil like that?"

"Oh, yes. Of course, I don't know what logic The Scientist will use in reading the data. His thought processes will be forever beyond us, but his method is clear and he will get a good picture of the chemical and molecular structure of the soil. A very good picture."

The Adviser for the Bacteria signaled for attention and his odd double voice came from the translator, "We are the Speaker. Manager, can you spare a Communicator so that we may contact and record the generations of our brothers?"

Jme said, "What? What do you mean?"

The Speaker answered, "We would like to contact our brothers in the soil, Manager. When the soil is dissolved by the chemicals, as you have described, there will be deaths. There already have been many in the digging. Since this is so historic an occasion, the ancestors of these generations should be recorded and not lost."

Jme said, "The soil Bacteria, of course; I had not remembered. Sprkss, can you reach them?"

"I don't know, H.M. How can I tell one colony from another. Wait one moment, Speaker. Wait . . . I have set three listeners in sets, to check the colonies. The colonies that show movement . . . they may triangulate the bucket.

"Ahh, there! We have them I think. One colony will give you a link to the others, won't it? Will you do the contacting, Speaker. The linkages for communication are quite difficult . . ."

"We are the Speaker. We will do that gladly, Sprkss. We know you will be needed elsewhere. We will speak to our brothers."

"Thank you. Here is your linkage." A sheaf of tendrils grew beside the Adviser's globe and fanned into invisible filaments. The swirling mass inside the globe darkened before the filaments as the Speaker concentrated the colonies necessary to do the job of communicating.

Jme watched the soil sample disappear into the body of the lander and the rod and its linkages retract. The lander was motionless for a time.

Sprkss reported, "It has sent another high-frequency pulse, H.M. We recorded it, but analysis will take time."



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"No hurry, Sprkss. The next experiment will probably commence soon. Let's watch that."

The lander slid out a wide flat panel. The panel came out with its flat side facing the ground, stayed in that position for a time and then began to rotate slowly on an axis parallel to the ground. As it turned the Advisers could see that it was a very thin sheet of some material held in a frame. It shivered slightly in the air movement caused by its turning.

Adviser Entne said, "It's like a leaf. The Scientist samples the air, now. How ingenious. With a very thin panel like that he would be able to feel density and air pressure; also wind speed, if there were any wind. Is there?"

Sprkss answered, "No, very calm. The air moves from the heat differential only. Just right. He will get excellent results."

Utoo asked, "Do you suppose he collects solar energy, too?"

Jme said, "I don't know. What is your opinion, please, Adviser Entne?"

Entne said, "I doubt it. The foil is not thick enough to carry receptors. We decided early, that those two blue-black leaves are the only receptors on the lander. I see no reason for another at this stage. Also, The Scientist likes to do one thing at a time. He is very precise."

Jme said, "You may be right.

"Was there any outgoing signal that time, Sprkss?"

"No, not this time. Either a malfunction, or the lander is going onto a programmed sequence."

"Keep monitoring."

"Staph, the life experiment may be next. Are you in position?"

Staph answered vocally. He had moved back to the Tree bore under the lander. He said, "Yes, H.M. I'm ready. The carrier is in the bore, now, with the solution of Little Brothers. The whole thing is right under the lander. I'll spray the solution up through the surface as soon as the probe touches."

"Very well, stand by.

"Sprkss, can you boost the magnification on some visuals so I can see the base of the lander? I want to see the probe when . . . the instant it comes out."

"I have that ready, H.M. Look at screen Two, please."

Screen Two showed the bottom of the lander and one leg at a very high magnification. The small rotating door that covered the probe could be seen. The visual angle was slightly up.

Sprkss said, "That's all the visuals I've got under the lander, Jme. I didn't want to get in Staph's way."

"Don't let them become visible from the lander, Tubes."

"The receptors are very small. I'm using light amplifying bundles farther back in the network."

"Good. I don't want to spoil the experiment by introducing anything The Scientist hasn't planned for."

Utoo said, "There's the probe. The door's opening!"



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A metal rod, supporting a glass tube descended slowly from the bottom of the lander, until it touched the ground.

Jme ordered, "Get in there, Staph!" He didn't reply.

The glass tube was supported just off the ground by the metal fingers when the probe came to rest. Then the metal fingers tightened and the glass tube broke.

Just as the fingers began to snap the tube, Staph acted.

He said, "Pressure!" and the end of the tube was misted by a thin fog. The fog appeared just as the glass snapped. Some of the fog and some dust from the sand swirled into the tube.

Utoo let out a purr of breath. He had been holding it and released it so loudly the Communicator radiated the sound. Utoo laughed and said, "There was a vacuum inside?"

Jme said, "Yes. Staph, it looked very good from here. I think you did it."

Utoo asked, "What about the water? Do you think that will hurt the lander's instruments?"

Staph answered, "It wasn't water. It was a chemical carrier for the virus population. It sublimed almost instantly. Anything left would be mostly silicones and ferrics. The same stuff that will be present in the dust and in our Little Brothers. The experiment will never notice it.

"Does anybody know if they have got there—the Little Brothers? The probe is retracting."

Jme asked. "Speaker, can you contact them?" The communication net for this had been set up in advance.

The Speaker's voice announced. "We are the Speaker. We cannot contact them very well. Our Little Brothers do not communicate like the rest of . . . Ahh!

"We will translate into verbals. Can you record them?"

Without waiting for an answer the Speaker went on: "They are saying, 'Food. Food. Rich, better food! It is all as was promised to our generations. Lovely, wonderful place. We can make much acid here. Already our relatives, er . . . ah, children, grow around us. Lovely long chains of acid; and the molecules rush to link and form . . . Food. Food!'

"They go on in the same thought. We offer the opinion that they have indeed arrived in the nutrient designed by The Scientist to receive them."

"Purragh! LOOK!!"

Jme twisted to face the screen at Utoo's cry. The lander pictured there was shrouded in smoke. Four puffs swirled out from each corner.

Then the shock wave hit the tunnels. The lights rocked and swung. Dust filtered from the walls. Jme saw the pave of the tunnel floor rise and fall like a wave.

Staph's voice went to full volume. "OUT! EVERYBODY OUT! Head for the crater wall!"

Jme realized the shock wave was reflecting from the permafrost above them and reenforcing the waves in



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the tunnel. A mild explosive shock was reverberating down the tuned tube like a major earthquake.

She spun, scooped the two Communicators off the console and made for the open car of the transporter. There was time to get the lid down and the power bar full out, when the ceiling came down behind them and the lights went out.

The lights went out, but the car moved forward fast and let the grinding rock fall. The car ran for half a minute, then stopped.

Jme said, "Now what? Power cut off?"

One of the Communicators radiated, "We are at a junction, Manager. The crater wall opening is over that way, of course. Not too far; see the light."

Jme had her sensors tuned for heat detection in the darkness; a reflex when the lights went out. She went back to visual and discovered the dim light, off to the left.

She said, "O.K. We walk." She got out of the transporter, picked up the two Communicators and went toward the light.

It was a crater-wall cave opening. More than that, it was one of Staph's observation posts and sported a com-console and a set of working lights.

Jme put the Communicators down on the console and said, "See if anything works, Boys. Tell them the tunnel behind us is down." She had seen the rock fall when the lights went on. "They might as well dig us out through the back tunnel. The transport tube we rode is probably blocked clear to the lift system."

The two Communicators went right to work, but they had to test almost all of the console's com-tubes before they found an open line. From that point, they were almost instantly in contact with Sprkss' net. The two of them linked themselves together with a jointed tube pattern and began operating the four-voice speakers on the console as if they were running a comm-net.

Jme said, "Take it easy, Tubes. We've only got to talk to them one at a time."

The Communicator said, "I'm Tellyr and he's Bellyr, of course. Don't worry, this is easy, Manager. There are a lot of people yelling for you. This way we can split them up and give you voice reproduction. It's just a job, of course."

Jme said, "Very well, Tellyr. You've told them we're here. Was anybody hurt? Find out what happened and how bad."

Sprkss' voice answered. "No serious casualties, Jme. Only the tunnel branch you were in collapsed. Staph's Communicators all were taken out safely."

Jme said, "Good. Wonderful. What happened? I know the shock wave reenforcement brought the permafrost down. I could see that. What exploded? The lander?"

Jme's Communicator said, "H.M., screen One. If Bellyr can handle all the vocal for a while, I can hold



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vision from Staph's crater-wall location. It's a 20X magnification and a recording and it will be spotty, of course."

Staph's voice came from the other Communicator. He said, "Jme, the lander ejected something, violently, and threw it a long distance away . . . over twenty meters. My attention was on retracting the ejection tube below the lander, so I didn't see any of *this,* but it was recorded."

*This,* turned out to be a pointed cylinder of dull metal lying half buried in the sand. There was a disturbed sand trail out from its pointed end, marking where it landed and slid.

Jme asked, "Is the lander still upright? Did the ground collapse under it?"

Staph said, "The lander is exactly as before, H.M. The ground is still good. I've got a crew checking the tunnels. They are also cutting through to you. That fall isn't too big, but the tunnels under the lander are all messed up."

Jme said, "Very well. Back to this explosion. I want an analysis set up, Sprkss, quickly. That was not on the first lander. We have to decide what kind of experiment is going on, and decide quickly. Opinions, Advisers?"

Sprkss said, "There were four smoke puffs, so logic says there are three more of these cylinders. We are hunting for them visually, now."

The cylinder moved. It slid on the sand.

As it moved, a very thin filament became visible. This was attached to the base of the unpointed end and the cylinder was being pulled backward by the filament. It now became obvious that the trail marks in the sand were not caused by the cylinder's impact, they were drag marks.

Adviser Entne said, "Communications, this has the feel of a Bush, or one of the Mosses. Can we see the corner of the lander?"

Sprkss worked his controls. He asked, "The corner nearest to the cylinder?"

Entne said, "I suspect that any corner will do."

The picture came on the screen as Sprkss actuated his vision network. It showed a corner of the lander and two objects that had not been there before—a short tube and a wide reel. Coming off the reel was more of the thin filament. It disappeared into the lander and stretched into the air in the other direction to connect to the moving cylinder on the sand. As they watched, the reel moved and the filament wound over it and into the lander.

Sprkss said, "That's not a commtube. It's being pulled in and drawing the slug back after it. That's just a cable, or rope, like the ones that worked the digger bucket."

Entne said, "It is part of another experiment."

Jme said, "Of course, but what is wanted. We don't know what The Scientist wants with this experiment."



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Staph's voice was patched into her panel. He said, "Jme, I can see the cables on all of those slugs, from here. They are all moving. Also, Jme, each cable is covered with something sticky. Dirt and grains of sand are adhering to it, covering it up, as it moves."

Entne interjected, "I thought so! Some of the Bushes act like that."

Jme said, "You know what the filaments are for, Entne?"

"I believe so. The Bushes collect nutrient that way. I believe this is a soil-sampling experiment. The Scientist, of course, has no need for nutrient, so he is collecting soil.

"The first experiment collected soil samples by the lander's roots, right? Well, it hasn't any root . . . er a . . . in close, then. Now, this experiment throws sticky cables out and gets samples away from the lander . . . out from under its leaves . . . ah . . . it doesn't have leaves, either, but . . . I mean, the logic is . . ."

Utoo finished, ". . . Is elementary. You've hit it!"

"What do we do about it, H.M.? Staph?"

Staph answered, "Me? Do? I can watch it. That's all. I haven't got any equipment or access tubes out that far. I haven't got much of anything; it's all broken up under the lander.

"The soil is normal out there, though. Just like it was before the first lander crashed in. I did that much. The soil is acceptable. It will analyze out very much like the near samples. No surprises."

Cybnd asked, "Why don't we just let the cables wind in?"

Staph called, "Jme? H.M.?"

Utoo said, "What is the matter with her? Is the comm-tube still open? Did anybody send a doctor with that rescue team? Medic!

"Never mind, I'll get him, myself."

Jme came out of her reverie. The colors of the cave mouth were bright and clear to her vision. A plan for dealing with those dragging filaments was also sharp in her mind. She began to direct her team. First a check on an item of data. She asked, "Staph, is the soil out there barren? Sterile?"

"Sterile." Staph had been trying to hurry up the tunneling crew; her question caught him by surprise. "No, not at all, if you mean chemically, Jme. It will support many forms of root life. Sprkss, can you display our analysis on that little visual unit she's got?"

Jme stopped him, "Never mind. I don't mean that. Does it have any other smaller life; Micro population or such?"

Staph answered, "Oh, well, I don't know, Jme. We kept no controls in this crater except near the lander. My statistics show the population should be in the lower three Sigma curve on Bacteria, Fungus and Micros. I can't be sure. We have kept all normal ecology out of this crater for something like nineteen to twenty



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days, now, while we studied the other lander and set up for this one. That is a long, long time, for Micro populations. I'd say the outer crater is pretty barren, Jme."

Jme said, "So would I, and that being the case, I think we owe it to The Scientist to send him some more of our Brothers. There were soil Bacteria in his bucket sample. Can you and your Communicators locate volunteers to ride the sticky filaments with those soil particles?"

Staph was amazed. "Jme, that's impossible. There are four widely separated filaments, smaller than any communicator tube. You want me to locate them, drill an approach tube and spray Bacteria colonies at them. It can't be done. My whole network under that lander has collapsed in the cave in. I'd need new tubes, Jme. Even if I could get the volunteers, those filaments are moving. Time them! They'll be retracted before I could bore the tubes."

Jme broke in, "Not tubes, Staph, dear. Please, listen. Use the crater gliders. The little fliers. There's one here in this cave with me. You must have some over there. Just use two of them, Staph, in one gliding pass across the crater. Oh, it will work, I know it will! Are they able to do that for you, the gliders? Are they willing enough to follow instructions?"

"Gliders! Oh!" Staph considered this. "Oh, sure, they'll do what they're told. We've made pets of some of them. I might even get one of the spray tubes to open on time. If they can carry one . . . I'll have somebody ask . . . Jme, what about the lander's vision system—if it sees one of these gliders?"

Jme said, "A calculated risk, Staph. Sprkss says the vision-power system is off. He'll monitor it, so check with him before you send the glider out. Oh, Staph, also make sure they can't drop a tube, will you? The Bacteria are acceptable, but broken plastic is not."

The Communicator, Bellyr, perched on the panel was waving his comm-rods and Jme searched for his frequency.

He said, "The Adviser for the Bacteria is talking, Manager. I will filter out his formalities." Then he changed the tone of his voice as Communicators did when they were translating and said, "Might we offer a delicate suggestion?"

Jme forced herself to answer. There was nothing she could do to help Staph with the gliders, but the last thing she wanted to do, now, was to talk to the Speaker of a Bacterial colony. She braced herself against the side of the tunnel and said. "Of course you may, Speaker. The Scientist is sampling members of your life form. Of all species on our planet, your advice is paramount. Please go on."

"Your assistant, Staph, being underground, is no doubt using a type of fungus to produce the visible light he requires. Our elders inform us that many of these higher, less colo-



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nized life forms reproduce by sporulation, and this they do violently, spreading their siblings over large distances from the parent."

Jme thought she was getting very sensitive about the subject, but it did seem like everybody was thinking about reproduction today. She spoke up sharply, "What is your suggestion, Speaker?" She really didn't have time for a biology lesson.

The translated voice answered her, "We suggest that your gliders might carry such types of fungi and present The Scientist with spores in place of Bacterial generations. It is such a sensitive subject, advising a species on the disposition of its offspring, that we hesitated . . ."

"Thank you. Your generations will be recorded." Jme cut him off with the formal phrase. The idea was good.

She asked, "Staph, can you do it?"

Staph's voice came from Tellyr, "My Tubes are checking the fungi, now. Yes! Easily. Good! Jme, I have the volunteers right here in the tunnel. We can send one of our small receptor comm-units along to take a light signal and the spores can be released right over the cables. Where they will fall . . . I can't control that, Jme."

Jme said, "If you can do what you have described it will be enough. Oh, send them out, Staph. Quick. We are talking too much!"

She turned out to face the opening of the cave. She pushed herself away from the tunnel wall so she could see the lander on the crater floor, and discovered that her corners were over and off the edge of the smooth paved tunnel floor. She was getting wider. She curled her edges in, and the pain began. Little rhythmic pulses that were easy to bear, but warned of more to come. Her back was almost flat and she had to force it into a decorative S-shape and hold it there.

She said, "Where is that rescue team?" But she didn't say it very loud.

She heard Sprkss' voice say, "No emission from the vision system, Staph. Go ahead." The Communicators were not transmitting anything else over the net.

Jme adjusted her vision for the light out in the crater and the distance to the lander and was in time to see the tiny gray-white glider dart from the crater wall. It swooped in a wide arc low down along the sand and then back up to the same spot on the crater wall again. That must be where Staph's other cave opening was located. The glider soared again and, as it tilted up to return, the bottom plan form of the swift animal was visible to Jme. From its pointed nose, the thin delta shaped *wings* of its body tapered sharply back. They gave one flap for power and stiffened to glide again. In that interval, Jme's ultra clear, sharpened, sight caught the shine of Staph's comm-unit and fungus, clutched tightly in the glider's claws.



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Then the fliers swooped away. A second white dart made the trip and the job was done.

Jme continued to stand and watch the lander until Sprkss reported the pointed cylinders were back aboard the lander. She said nothing; did nothing. She ignored the congratulatory chatter coming from Tellyr and Bellyr behind her. She didn't seem to hear the falling rock from the collapsed end of the tunnel or notice the swirling cloud of dust that blew past her.

The pain she couldn't ignore any more.

It came at her in jumps and waves. When it was there, she couldn't see or hear. When it went away, she filled her mind with insistent commands for silence. She mustn't cry out, or scream; just hold on and wait for the next spasm.

Suddenly she realized that Utoo was in front of her. His heavy paws gripped her sides and the flat red head blocked her view of the crater from a foot away. All those teeth.

Then there were two of him and more pain, then one, then two again. So many teeth.

Utoo said, "Jme, what's wrong?" His voice roared at her; twice its usual volume.

*Too loud, Utoo,* she thought, vaguely, *it hurts.*

A voice behind her yelled, "The light! The flare! What's that?"

She fought back the pain and struggled against Utoo's hands to see past his great head and shoulder.

The lander, out on the crater! Its motor had fired. In a flare of dust and flame, it was rising off the crater, climbing higher, higher. The Scientist had finished his experiments and called back his instruments. The lander went higher and then there were two of them in the sky. Two landers, more pain, and two of Utoo, rimmed in the cave opening with all of his teeth.

Jme said, "You have lots of teeth." Her voice was weak.

Utoo whirled. He saw her standing, straight and flat, swaying back and forth in the middle of the tunnel. Down the center of her body from top to bottom was a fuzzy band, the color of her back, that was getting darker.

Utoo yelled, "Medic! The Manager . . ."

A doctor, Dr. Boon, was sliding in beside Utoo. He said, "Quiet. This is no yelling thing. I'm here. Use your hands, big one, not your tongue. As gently as I know you can; get her down flat before she falls over. Easy! She is hurting in pain."

Utoo cradled her across his arms and brought her to the floor. The doctor had unfolded a pad from his case and spread it on the pave of the tunnel.

He pointed, "On that! Face down."

Utoo said, "Face down?"

Dr. Boon said, "Certainly. I want her energy receptors turned up to those lights. She needs as much



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energy as she can get. Can anybody turn those lights up brighter? Do it! The light won't hurt any life form in here. Somebody check it, quick! Also I need a privacy screen."

Sprkss' voice came from the comm-panel, "On the way, Doctor, and the lights are coming up. How is she?"

Boon said, "She is hurting. Very bad, but only for a little, Jme. This is the worst. The nucleus pulls apart, you understand, so it hurts. Sure it does. That's where you carry all your pretty little pain cells."

Jme managed to say, "The . . . lander? It . . . flew?"

Boon kept talking. "Don't worry about your precious machine. Sure it flew. Lots of fire. I saw it myself. Relax. Relax. Don't fight the pain. Let it happen."

Two thick tubes folded across the tunnel floor from Tellyr on the comm-panel. One of them carried a resonator for voice. It said, "Doctor, I am talking, for Staph, since I had no duties. All is well with the lander. It took off and will meet the orbiting section in a few hours. Staph is cleaning up around the crater. Tell her when you can, of course."

Boon was opening his equipment case. He said, "She heard you, loudmouth. There's nothing wrong with her ears.

"Ahh! There! Pyr's syndrome. Look, the color fades. Good. The pain will stop now." He pointed to a gray-white stripe that was materializing in the black color of Jme's back, also running from top to bottom.

Tellyr asked. "Do you need my receptors, Doctor? I am capable of medical detection. Ah, I see you have your own Communicator, of course."

The doctor was placing the tubes of a small medical Communicator on Jme's back. Boon said, "I don't need anything, but that privacy screen. Get out of my way!"

The screen arrived, as he was complaining. Two mobiles shoved it up through the hole in the rubble and placed it around the group, then scurried back to help enlarge the tunnel opening. Utoo rose to join them.

Dr. Boon said, "No. Stay with me, big one. Sometime maybe, I might need your hands again."

Utoo said, "You want me to help with surgery?" He stared down at his hands.

"Surgery? No, nothing like that. I explain . . . No. No time. Anyway, soon I don't need an explanation."

He went on talking softly to Jme. "Now, Jme, you are going to stop sensing, black out, pretty soon. Don't worry. It happens. You will wake up, fine, and I will stay with you. You will not be alone. Far from it.

"Now, the respiration and heartbeat have doubled. That we were waiting for. Now, it begins, Jme. The pain is all gone, yes? So, you can relax. Soak up the energy and spread it out. Stop worrying about your lander. Stop worrying about how



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wide you are. You are very wide and beautiful and getting bigger." His voice was crooning, not really saying anything, just soothing. "You are big, but this red Runner . . . Heh, Utoo . . . is here and that monster is a whole lot bigger. He will help and I am here to help. You are not alone, Jme."

Under Boon's direction, the medical Communicator was touching Jme's body with his detector rods at various places. The rods seemed to find no trouble, at least they didn't linger in any one spot on her body, but her body itself was changing. Utoo watched in horror, his leg muscles stiffening to push him away from the tunnel floor as his tension increased. Her body . . .

The dull black rectangular shape of her back had become a bright shiny surface, now. As he watched, it shrank in length and got wider and wider. At the same time the gray band in the middle of her back grew lighter and whiter. Her body began to puff up, swell and thicken along this band. The band became translucent, and Utoo began to see things through it. His imagination was picturing Jme's inner organs, when he recognized the doctor's detector probes *underneath* the pale strip. He was looking *through* her body. No; through a thin, transparent skin . . .

Suddenly a low rumbling laugh began deep behind Utoo's clenched teeth. His mouth relaxed open and he sagged into a crouch as he loosened his leg muscles. The suddenness of her attack; the pressure of the work and the cave in, he had only just now realized what was happening to Jme. Again he growled his purring chuckle.

Dr. Boon looked up. He said, "So your father did get around to telling you about the Mosses and Spores and Bacteria and pretty parthenogenic female Habitat Managers, did he? What did you think, viral plague, or ferric mold cancer, huh?"

"Something like that. Do they know; Staph and the others?"

"Sure. My Tubes here contacted Sprkss to get the hospital set up. He ordered two stretchers. Hold a minute! There! It's all done!"

The membrane between the two halves of Jme's body had thinned and split down the center. The pad on the floor now held two flat black rectangles. The black color was rapidly losing its unnatural shine, as the two units, Jme and her son, began to thin and reshape themselves to their normal proportions.

Dr. Boon's Communicator waved his rods over the two, touching, analyzing.

Boon said, "Now, I must find out which one is our pretty Jme. How do I tell? Easy. She is all female, now. The male part separates. Ahh! That one . . ." The Communicator had finished his diagnosis and indicated the left-hand unit with one tube, this was Jme, while it fastened all the rest on the right-hand one to monitor the new life. "Thanks, Tubes."

Utoo asked, "Jme?"



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Dr. Boon said, "Yes. This is our pretty. You must have noticed that she was getting more and more female as her time neared. So, now, all the male part of her is in her son, there. She, Jme, can be a beautiful female again for a while. And don't you ever tell her she's fat, you hear, you mouth full of teeth."

Utoo growled a laugh.

Boon said, "Where is that other stretcher team? Get rid of that screen. Who needs privacy, now. She's beautiful again and she has a lovely son, with all her brains and skill. A few months in the creche learning to use his equipment and we have got a useful citizen."

Utoo moved the screen to find everyone crowding into the tunnel opening. Staph, Msee, and another Runner were in the forefront with enough Communicators to let him know that everybody was looking and listening. Carefully he reached down and turned Jme over so she could see.

Jme said, faintly, "The lander?"

Utoo said, "It left, Jme. The job is done."

Jme said, "I know. We did it, Utoo. I didn't think I could, but I did." Her voice was very faint, she was tired and her back wasn't getting any energy. "We gave The Scientist everything his lander was looking for, just like he planned it. We did it, Utoo."

Utoo said, "You did it, Manager. You did it." ■

## The Analytical Laboratory

| PLACE | TITLE | AUTHOR | POINTS |
|---|---|---|---|
| **February 1971** | | | |
| 1. | The World Menders (Part 1) | *Lloyd Biggle, Jr.* | 1.45 |
| 2. | Polywater Doodle | *Howard L. Myers* | 2.57 |
| 3. | The Claw and the Clock | *Christopher Anvil* | 2.62 |
| 4. | The Pickle Barrel | *Jack Wodhams* | 3.82 |
| 5. | Wrong Attitude | *Joseph Green* | 4.29 |
| **March 1971** | | | |
| 1. | The World Menders (Part 2) | *Lloyd Biggle, Jr.* | 1.35 |
| 2. | The Missing Man | *Katherine MacLean* | 2.45 |
| 3. | The Operator | *Christopher Anvil* | 2.79 |
| 4. | May the Best Man Win | *Stanley Schmidt* | 3.30 |

THE EDITOR



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# *with friends like these . . .*

It is not necessarily true that the ideal friend is some strong entity who will fight effectively against your common enemy. That needs qualifications!

ALAN DEAN FOSTER
Illustrated by Leo Summers

As she commenced her first approach to the Go-type sun, the light cruiser *Tpin*'s velocity began to decrease from the impossible to the merely incredible. Her multidrive engines put forth the barely audible whine that signified slowdown, and she once more assumed a real mass that the normal universe could and would notice.

Visual observation at the organic level became possible as the great ship cut the orbit of the last gas giant. Those of the vessel's complement took the never dull opportunity to rush the ports for a glimpse of a new solar system; those whose functions did not include the actual maneuvering of the craft. Curiosity was a fairly universal characteristic among space-going races. The crew of the *Tpin,* although a grim lot, were no exception.

Within the protected confines of the fore control room of the half-kilometer long bubble of metal and plastic, Communicator First Phrnnx shifted his vestigial wings and asked Commander First Rappan for the millionth time what the hell-equivalent they hoped to find.

"Phrnnx," Rappan sighed, "if you haven't been sufficiently enlightened as to the content of the legends by now, I fail to see how I can aid you. Instead of repeating yourself for the sake of hearing yourself oralize, I suggest you bend a membrane to your detection apparatus and see if you can pick up any traces of that *murfled* Yop battleship!"

Phrnnx riffled his eyelids in a manner indicative of mild denial, with two degrees of respectful impatience. "We lost those inept yipdips five parsecs ago, sir. I am fully capable of performing my duties without any well-intentioned suggestions from the bureaucracy. Do I tell you how to fly the ship?"

"A task," began Rappan heatedly, "so far beyond your level of comprehension that . . . !"

"Gentlebeings, gentlebeings, please!", said the Professor. Subordinate and commander alike quieted.

The "Professor"—his real title was unpronounceable to most of the crew—was both the guiding force and the real reason behind the whole insane expedition. It was he who rediscovered the secret of breaking the Terran Shield. He came from a modest three-system cluster nearly halfway to the Rim—far removed from their own worlds. Due to the dis-



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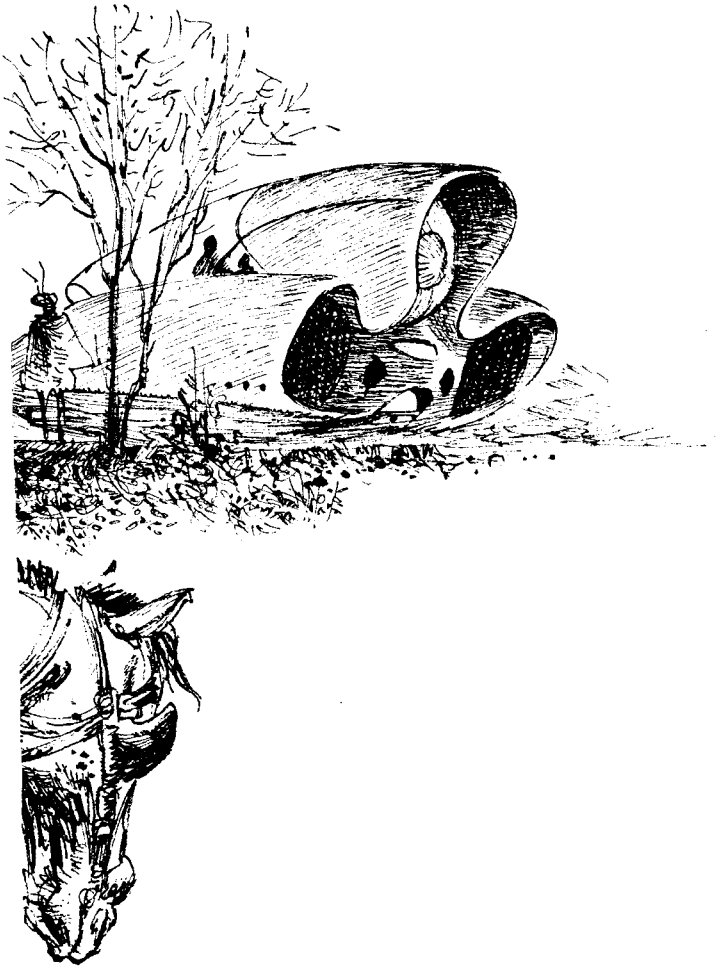

tance from things and to their own quiet, retiring nature, his folk took little part in the perpetual cataclysm of the Federation-Yop wars. What small—if important—role they did deign to play in the conflict was not occasioned by choice. Rather, it was engendered by the Yop policy of regarding all those peoples, who were not allies of the Yop, as mortal enemies of the Yop. There was room in neither Yop culture, or Yop lan-



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guage, for the concept of a "neutral." Yop temperament was such that their total complement of allies came to a grand total of zero. The members of the Federation had matured beyond prejudice, but it was admitted in most quarters that the Yops were not nice people. Possibly some of this attitude stemmed from the Yop habit of eating everything organic that moved, without regard for such minor inconveniences as, say, the intelligence of the diner, or his desire to be not-eaten.

Against them was allied the total remaining strength of the organized galaxy; some two hundred and twelve federated races.

However—due to diet, perhaps—there were a lot of Yops.

The avowed purpose of the expedition was to make that latter total two hundred and thirteen.

The Professor continued in a less stern tone. "If you *must* fight among yourselves, kindly do so at a civilized level. At least out of deference to me. I am an old being, and I possess a perhaps unreasonable allergy to loud and raucous noises."

The others in the room immediately lowered their voices in respect. In the Federation age was a revered commodity, to be conserved as such. And there was no denying the Professor's age. His antennae drooled noticeably, his chiton was growing more and more translucent, losing its healthy purple iridescence, and his back plates were exfoliating in thin, shallow flakes. That he had held up as well as he had on this trip, with its sometimes strenuous dodging of Yop warships, was in itself remarkable. He seemed to grow stronger as they neared their objective, and now his eyes, at least, glowed with a semblance of vitality.

All eyes were trained on the great mottled sphere turning slowly and majestically below them.

"Planet Three," intoned Navigator First. "Primary colors blue, white, brown, green. Atmosphere . . .", and he dropped off to a low mumbling. At last, "It checks, sir."

"And the gold overlay?" asked Communicator Phrnnx, for being among the youngest of the crew, his curiosity quotient was naturally among the highest.

"That, gentlebeings, means that the Shield is still up. After all these years I'd thought perhaps . . ." The Professor made what passed for a shrug among his people. He turned from the port to the others.

"As you all recall, I hope, the phenomenon below us, the 'Shield', is the direct result of the Old Empire-Terran Wars of ages ago. At that time, the inhabitants of this planet first broke free of their own system and started to come out to the stars.

"They found there a multi-racial empire nominally ruled by a race known to us as the Veen. The Terrans were invited to join the empire, accruing the same rights and privileges as had historically been granted to all new space-going races



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for thousands and thousands of years."

"And they refused," put in Rappan.

"Yes, they refused. It became quickly apparent to the Veen that the Terrans intended to carve out a little pocket empire of their own in another sector of space. Since Terra was so far away from the center of things, so to speak, the Veen decided that for the sake of peace . . . and the Veen . . . this could not be allowed to take place. Accordingly, there was a war, or rather, a series of wars. These lasted for centuries, despite the overwhelming numerical superiority of the Veen. Gradually, the Terrans were pushed back to their own home world. A standoff ensued, as the Veen and their allies were unable to break the ultimate defenses of the Terrans.

"Then a great scientist of one of the allied races of the Veen discovered, quite by accident, the quasi-mathematical principle behind the Shield. The nature of the Shield forbade its use on anything smaller than a good-sized moon. It was thus useless for such obvious military applications as, for example, a ship defensive screen. Then someone got the bright idea of enveloping the entire planet of Terra in one huge Shield, making it into an impenetrable cage. At worst, it would provide the Empire with a breathing spell in which to marshal its sorely battered forces. At best it would restrict the Terrans to their own fortress until such time as the Veen saw fit to let them out. The chances of the Terrans accidentally stumbling onto the same principle was considered to be slight. As you can now see, this indeed has been the case." The Professor sighed again, a high, whistling sound.

"However, the wars with Terra had also depleted the resources of the Veen tremendously. Those races which had been allied to them only by virtue of the Veen's superior knowledge and strength saw an irresistible opportunity to supplant the Veen in the hierarchy of Empire. The result? The Time of Conflicts, which resulted in the breakdown of the Empire, the final elimination of the once-proud Veen, and after considerable bickering and fighting, the formation of our present Federation—in a much more primitive form, of course."

He returned his gaze once again to the blue-white planet circling below, its land areas blurred in the shifting golden haze which was the by-product of the Shield. They had already locked in to the Shield station on the planet's only satellite. "Unfortunately, the Ban still remains."

Rappan broke away from his console for a moment. "Look, we've been through all that. The supposed rule states that the penalty for breaking the Shield either partially, or completely, is death, for all those concerned. But that *murfled* law is millennia old!"

"And still on the books," retorted old Alo, the Commander Second.



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"I know, I know!", said Rappan, adjusting a meter. "Which is one reason why every being on this ship is a volunteer. And if I thought we had a choice I'd never have commandeered the *Tpin* for this trip. But you know as well as I, Alo, we *have* no choice! We've been fighting the Yops now for nearly three hundred *sestes*, and been losing ever since we started. Oh, I know how it looks, but the signs are all there. One of these days we'll turn around for the customary reinforcement and *piff!*, they won't be there! That's why it's imperative we find new allies . . . even if we have to try Terra. When I was a cub, my den parents would scare us away from the *Grininl*-fruit groves by saying: 'the Terrans will get you if you don't watch out!"

"'Ginst the Edict," murmured Alo, not to be put off.

Navigator First Zinin broke in on the heavy bass-rumbling of his heavy-planet civilization. "There will be no Edicts, old one, if the Yops crush the Federation. We must take *some* risks. If the Terrans are willing to aid us . . . and are still capable of it . . . I do believe that GalCen will agree to some slight modification of the rules. And, if these creatures have fallen back to the point where they can be of no help to us, then they will not be a threat to us either. GalCen will not be concerned."

"And if by chance mebbee they should be a bit angry at us and decide to renew an ancient grudge?" put in the ever pessimistic Alo.

"Then the inevitable," put in Zinin, "will only be hastened."

Philosophizing was of needs broken off. The *Tpin* was entering the Shield.

*Green,* thought Phrnnx. *It is the greenest nontropical planet I have ever seen.*

He was standing by the end of the ramp which led out from the belly of the cruiser. The rest of the First Contact party was nearby. They had landed near a great mountain range, in a lush section of foothills and gently rolling green. Tall growths of brown and emerald dominated two sides of their view. In front of them stretched low hillocks covered with what was obviously cultivated vegetation. Behind the ship, great silver-gray mountains thrust white-haloed crowns into the sky. Had the *Tpin* been an air vessel, the updrafts sweeping up the sides of those crags would have given them trouble. As it was, they merely added another touch to the records the meteorologists were assembling.

Somewhere in the tall growths—which they later learned were called *trees* —a brook of liquid $H_2O$ made gurgling sounds. Overhead, orinthorphs circled lazily in the not unpleasant heat of morning. Phrnnx was meditating on how drastically the Shield had affected the normal climate of this world when he became aware of Alo and Zinin strolling up behind him.



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"A peaceful world, certainly," said Zinin. "Rather light on the oxygen and argon, and all that nitrogen gives it a bit of odor, but on the whole a most pleasant ball of dirt."

"Humph! From one who burns almost as much fuel as the ship I wouldn't have expected compliments," grumbled Alo. "Still, I'll grant you, 'tis a quiet locale we've chosen to search out allies. I wonder if such a world did indeed spawn such a warlike race, or were they perhaps immigrants from elsewhere?"

"They weren't, and it didn't," interposed the Professor. He had relinquished the high point to the commander and his military advisers, as their conversation had bored him.

"Mind explaining that a mite, Professor?" asked Alo.

The Professor bent suddenly and dug gently in the soft earth with a claw. He came up with a small wiggling thing. This he proceeded to pop into his mouth and chew with vigor.

"Hm-m-m. A bit bitter, but intriguing. I believe there is at least one basis for trade here."

"Be intriguing if it poisons you," said Phrnnx with some relish.

The Professor moved his antennae in a gesture indicative of negativity, with one degree of mild reproach. "Nope. Sorry to disappoint you, youngster, but Bio has already pronounced most of the organics on this planet nontoxic. Watch out for the vegetation, though. Full of acids and things. As to your question, Alo. When the Terrans . . ."

"Speaking of Terrans," put in Zinin, "I'd like to see one of these mythical creatures. I don't recall seeing any cities on our descent."

"Neither did Survey. Oh, don't look so smug, Navigator. Survey reports their presence . . . Terrans, not cities . . . but they estimate no more than a hundred million of them on the planet. The only signs of any really large clusterings are vague outlines that could be the sites of ancient ruins. Might have expected something of the sort. People change in a few *Ipas,* you know."

"*My* question," prompted Alo once more.

"Well, when the Terrans went out into extra-solar space and began setting up their own empire, the Veen decided at first to leave them alone. Not only was there no precedent for a space-faring race not accepting citizenship in the empire, but the Terrans weren't bothering anyone. They were also willing to sign all kinds of trade agreements and such. Anything of a nonrestrictive and nonmilitary nature."

"Why'd the Veen change their minds, then?" asked the now interested Phrnnx.

"Some bright lad in the Veen government made a few computer readings, extrapolating from what was known of Terran scientific developments, rate of expansion, galactic acclimatization, and so on."

"And the result?"



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"According to the machines . . . and the Veen had *good* ones . . . in only one hundred *Ipas* the Veen would have to start becoming acclimatized to Terra."

Zinin was the only one of the three listeners who expressed his reaction audibly. Surprisingly, it was by means of a long, drawn-out whistle.

"Yes, that's about how the Veen took it. So they decided to cut the Terrans down to where they would no longer be even an indirect threat."

"Seems they did," said Alo, gazing up at the goldflecked Shield sky.

The Professor spared a glance the same way. "Yes, it would seem so." He stared off in the direction of the commander's post where a force-lift was depositing a ground car. "But it's enlightening to keep one other little thing in mind."

"Which is?" said Alo belligerently.

"There *are* no more Veen."

Survey had detected what appeared to be a small, artificial edifice down in the slight dip between the foothills. It was, therefore, decided that a party consisting of Commander Rappan, Navigator Zinin, Communicator Phrnnx, a philologist, a xenologist, and of course, the Professor, would take a ground car down to the structure and attempt a First Contact. Despite vigorous protests, Commander Second Alo was restricted to acting captain.

"Give the crew land-leave," instructed Rappan. "Shifts of the usual six. Maintain a semialert guard at all times until further notice. I know this place looks about as dangerous as a *mufti*-bug after stuffing, but I intend to take no chances. At the first sign of hostilities, raise ship and get out. That is a first-degree order. You have others on board who can operate the remote Shield equipment. In the event that all is not what it seems, I don't want to leave these creatures a way out."

"Noted and integrated, sir," replied Alo stiffly. And then in a lower voice, "Watch yourself, sir. This place smells funny to me, and I am not referring to the nitro in the atmosphere, either!"

Rappan essayed a third-level smile, with two degrees of mild affection, nonsexual. "You've said that now on . . . let's see . . . thirty-nine planet-falls to date. But rest assured I will take no chances. We know too little of this place, including the Professor."

"Anyway, legends are notoriously nonfactual."

The little car hummed softly to itself as it buzzed over the dark soil. A cleared path is unmistakable on any planet, and this one ran straight as an *Opsith* through the fields of low, irrigated plants. Phrnnx had wondered idly what they were, and if they would appeal to his palate. The Professor had replied by reminding him of Bio's warning about plant acids and added that stealing the na-



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tive's food would be a poor way to open friendly negotiations. Phrnnx discarded the notion. Besides, the vegetation of this area appeared to be disgustingly heavy in cellulose content—doubtlessly bland in flavor, if any. And there had been no sign of domesticated food animals. Was it possible these people existed solely on wood fibers? It was a discouraging thought.

He had no chance to elaborate on it, for as the car rounded the first turn they had come to, they were confronted by the sight of their first native. The car slowed and settled to the earth with a faint sigh.

In the nearby field a shortish biped was walking smoothly behind a large brown quadruped. Together they were engaged in driving a wedge of some bright metal through the soft soil, turning it over on itself in big loamy chunks. The name of this particular biped happened to be Jones, Alexis. The name of the quadruped was Dobbin, period.

The two natives apparently caught sight of the visitors. Both paused in their work to stare solemnly at the outlandish collection of aliens in the ground car. The aliens, pop-eyed, stared back. The biped wore some kind of animal skin shirt. This was partly hidden by some form of artificial fabric coveralls and boots. Seeing this, it occurred to Phrnnx that they must have *some* kind of manufacturing facilities somewhere. The quadruped wore only a harness, again artificial, which was attached to the metal wedge. It soon grew bored in its survey of the aliens and dropped its head to crop patiently at the few sparse bits of grass that had so far managed to avoid the plow.

Commander Rappan's instinctive reaction to this first move was to reach for his pistol. He was momentarily abashed to find it missing from its customary place in his shell. The Professor had insisted that all contact was to be open and trusting from the first. Consequently, all weapons had been left back on the ship. The Professor had also looked longingly at the bristling gunports of the *Tpin,* but the commander and his advisers had adamantly refused to leave the ship unprotected. The Professor had patiently explained that if the Terrans were going to be any real help against the Yops, then the guns of the *Tpin* would hardly be effective against them. And if they weren't going to be, then the guns weren't needed. As might be expected, this argument went far over the heads of the soldiers.

But Rappan still felt naked, somehow.

The native made no threatening gestures. In fact, he made no gestures at all, but instead continued to stare placidly at the petrified load of explorers. After several minutes of this, Rappan decided it was time things got moving. Besides, the native's unbroken stare was beginning to make him feel a bit fidgety, not to mention silly.

"You, philologist! Can you talk to



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that thing?" Commander Rappan asked.

The philologist, a meter-tall being from a Ko star near Cen-Cluster, essayed a nervous reply. "It remains to be seen, sir. We have no records of their speech patterns, and there were few broadcasts to monitor the computers to as we descended." His voice was faintly disapproving. "I am not even sure which of the two creatures is the dominant form."

"The large one in the lead, certainly," said the xenologist.

"I believe the Terrans are described in the legends, when not as hundred *foomp* high fire-breathing monsters, as bipeds," said the Professor quietly. "Although it also has four limbs, two are obviously manipulative. I suggest that one."

"I shall have to work from next to nothing," protested the philologist.

"I don't care if you do it holding your breath, but get out there and do *something!* I feel like an idiot sitting here."

"Yes, sir."

"Yes, sir—*what?*"

The philologist decided that this would be an auspicious time to essay a First Contact. He hurried out the door. At least, he thought, the native couldn't be much more difficult to communicate with than the commander. He wished fervently that he was back in the community nest.

Trailing the philologist, the party made its way to the two natives.

"Uh," began the philologist, straining over the guttural syllables, "we come in peace, Terran. Friends. Buddies. Comrades. Blut-burderhood. We good-guys. You comprende?"

"Me, Tarzan; you Jane," said the Terran.

The philologist turned worriedly to Rappan. "I'm afraid I can't place his answer, sir. The reference is obscure. Shall I try again?"

"Skip it," said the Terran, in fluent, if archaic, Galactico. "Ancient humorism. Surprising how old jokes stand time better than most monuments." He seemed to sigh a little.

"You speak!" blurted the xenologist.

"An unfortunate malady of which I seem incapable of breaking myself. Sic transit gloryoski. Up the Veen. But come on down to the house. Maria's making some ice cream . . . I hope you like chocolate . . . you're welcome to try it, although I don't think we'd have enough for King Kong, here."

Zinin decided to regard this unfamiliar aphorism as a neutral compliment. There wasn't much else he could do. He tried to hunch his three-meter bulk lower, gave it up when he realized that he didn't know whether the promised ice cream was a food, a paint, or a mild corrosive for cleaning out reluctant teeth.

"We appreciate your hospitality, sir. We've come to discuss a very urgent matter with your superiors. It involves perhaps more than you can



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comprehend." Here the Professor peered hard at the native, who looked back at him with placid assurance. "Although I have a hunch you might have some idea what I mean."

If the Terran noticed a change in the Professor's glance he gave no sign, but instead smiled apologetically.

"Ice cream first."

The Terran's residence, when seen from close up, was a utilitarian yet not unbeautiful structure. It appeared to be made mostly from native woods, with a hint of metal only here and there. A small quadruped was lying on its entrance step. It raised its head to gaze mournfully at the arrivals, with wise eyes, before returning it to its former position on its forepaws. Had the Professor known anything about the history of Terran canines, this quiet greeting would have been interesting indeed.

The building proved to admit more light and air than had seemed probable from the outside. Funiture appeared to be mostly of the handmade variety, with here and there an occasional hint of something machine-turned. Bright colors predominated but did not clash, not that the Terran color-scheme meant anything to the visitors anyway. At least the place was big enough to hold all.

The Jones's mate was a sprightly little dark woman of indeterminate age, much like her husband. A single male sibling by the name of Flip stared solemnly from a window seat at the grouping of guests assembled in his parent's den. He had a twig, or stick, which he would sometimes tap on the floor.

"Now, Alex . . ." said the woman, fussing with a large wooden ice cream maker, "you didn't tell me we were having visitors. How am I supposed to prepare for these things if you don't tell me about them in advance?"

The native smiled. "Sorry, hon, but these, um, gentlemen, just sort of dropped in on us. I promised them some ice cream."

"I hope they like chocolate," she said.

When they had been seated around the room, each being curling up according to the style fitting to its own physiognomy, Commander Rappan decided to break into the cheerful dialogue and get down to business. Fraternizing with the natives was all very well and good. No doubt the Xeno Department would approve. However, he was not so sure that his colleagues, hard-pressed to hold off the Yop waves, would see things in the same way.

Unfortunately, this thing called *ice cream* got quite a grip on one's attention.

Zinin was one of the few present to whom the concoction had proved unappealing. He leaned over and whispered to Phrnnx, "These are the deadly fighters we are supposed to enlist? Conquerors of the Veen



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fleets? Stuff of horror tales? Why, they look positively soft! I could crush that male under one paw. He hardly comes up to my eyes!"

"Few of us do, oh hulking one," replied Phrnnx, adding a gesture indicative of second-degree ironic humor. "But that is hardly an indication one way or the other. Although I admit they *do* seem a bit on the pastoral side."

Zinin snorted.

"What star system are you folks from? Not all from the same, surely!"

"Indeed," said the Professor. It occurred to him what had troubled his thoughts ever since they had met these natives. For a race that had not had extraplanetary contact for umpti-thousand *Ipas* they were treating the crew of the *Tpin* like next-next neighbors who popped over for a visit every time-period. Even the sibling . . . where had *he* disappeared to? . . . had been fully self-possessed when confronted by what must be to him utterly strange beings. It was just a touch unnerving. "You might be interested to know that the Veen have been extinct for some 450,000 of your time-revolutions."

The biped nodded understandingly. "We guessed as much. When so much time passed and nothing happened, one way or the other, friendly or hostile . . . we assumed that we'd been forgotten and filed away somewhere."

"Not forgotten," said the Professor. "Legends persist longer than their creators, sometimes. There was a period of . . . confusion . . . at the end of the Veen-Terran wars." (Was that a twitch of reaction in the native's face? Yes? No?) "When the bureaucracy set up by the Veen was submerged by a wave of would-be empire-builders, interstellar government pretty well collapsed. It took a while for things to straighten themselves out. Which is why we have not contacted you till now. (Could he read the lie?) Another problem has arisen."

The biped sighed again. "I was afraid this mightn't be a social call. What is your problem, Professor?"

Backed at certain intervals by succinct comments from Rappan, he began to outline the present desperate situation with respect to the Yops, ending with a plea to forget any past differences and come to the aid of the Federation.

The Terran had listened quietly to their arguments, unmoving. Now he sat in an attitude of intense concen-



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tration, seeming to listen to voices and thoughts outside their ken. When he at last raised his face to them again he wore a serious smile.

"I must, of course, consult with and deliver your message to my . . . 'superiors'. Such a decision would be difficult for us to make. As you can see for yourselves"—he made an all-encompassing gesture—"we have changed our mode of existence somewhat since we fought the Veen. We are no longer geared to the production of war material. Incidentally, we hold no grudge against any of you. I have no idea if my ancestors and yours ever met, let alone battled with one another. We never even really held animosity towards the Veen. In fact, I'd give a lot to know exactly *why* they went to war with us in the first place."

Phrnnx had heard the Professor's explanation and looked expectantly in his direction, but that worthy remained silent.

"Of course," continued the Terran after a while, "as a gesture of your goodwill we would naturally expect you to lower the Shield. Despite a hell of a lot of scribbling and figuring, that's one thing we could never quite do."

"Of course," said Rappan determinedly.



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The biped stood. "It will take me a while to convey your message to my superiors. In the meantime, do feel free to enjoy the countryside and my poor home." He turned and walked into another room.

The female eyed them speculatively.

"I don't suppose any of you gentlemen play bridge?"

Phrnnx was wandering through the nearby forest, following the path made by the cheerful stream. He had quickly grown bored with studying the simple native household, and, unlike the Professor or Commander Rappan, the intricacies of Terran "bridge" were a touch more intellectual a pastime than he wished for. The two scientists had found plenty to keep them occupied profitably, but after reporting to the ship their accumulated data and the word that things seemed to be progressing satisfactorily, there had remained little for a communicator to do.

The dense undergrowth led away from the house at a right angle. With the sense of direction his kind possessed he was not afraid of getting lost, and the damp coolness of the place was the closest thing he'd found to the rain forests of home. It was full of interesting sounds and new smells. The native female had assured him that no dangerous creatures lurked within its inviting shadows. He was thoroughly enjoying himself. Orinthorphs and small invertebrates . . . "insects," they were called . . . flitted rapidly from growth to growth. He could have snatched them easily in midair with his long suckers, but was mindful of strange foods despite the Professor's assurance that the native organics were edible. Besides, he was not hungry. He strode on in high spirits.

The hike was about to come to an unpleasant end.

The trees appeared to cease abruptly off to one side. Espying what seemed to be a glint of sunlight on water he turned in that direction. His supposition was correct. In front of him was a large clearing which bordered on a good-sized lake. In the foreground stood the diminutive figure of Flip, the native's offspring. He was gazing at a pair of massive, glowering figures in space armor. These did not fit into the picture.

Yops!

Phrnnx stood paralyzed with shock. The Yop battleship that he thought they had lost near that red dwarf sat half-in, half-out of the blue-green lake. He assumed it was the same one. Its gunports were wide open. Troops were clustering around a landing portal on one side of the kilometer-and-a-half-long monster. Dirt had been gouged out on all sides by the sheer mass of the huge vessel. These two figures in the foreground were doubtlessly scouts.

How in the central chaos had they slipped in past the cruiser's screens? Unless they, too, had found a way to negate the Shield—and this seemed unlikely—then they must have en-



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tered by way of the temporary hole made by the *Tpin*. A quick glance at the sky showed the now familiar gold tinge still strong. So they hadn't destroyed the generating equipment on the planet's satellite, then. Yop invisibility screens were known to be good, but this good? . . . His speculations were interrupted by what happened next.

The nearest Yop reached down and lifted the Flip in one massive, knobby claw. It held it like that, steady, while it examined the youngster along with its partner. The boy, in turn, appeared to be examining them with its wide, deep-gray eyes. Both were making the motions and gestures which Phrnnx knew indicated Yop laughter.

What followed occurred so rapidly that Phrnnx, afterwards, had difficulty in reconstructing the incident.

The Yop raised the youngster over its horned head and swung it towards the ground with every intention of smashing the child's brains out. But the boy abruptly slowed in midair, turned, and landed gently on its feet. The Yop was staring at its now empty hand in surprise. The expression of placid innocence, which had heretofore been the child's sole visage, shifted all at once into a strong frown that was somehow more terrifying than any contortion of rage could have been. It said, in a very unchildlike tone of voice, two words.

"Bad mans!"

And gestured with the twig.

The two Yops glowed briefly an intolerable silver-white, shading to blue. It was the color of nova—a chrome nova. The two scouts "popped"loudly, once, and disappeared. In their places two clouds of fine gray ash sifted slowly to the ground. The boy pointed his stick at the multi-ton Yop warship. "More bad mans," he said. The ship abruptly glowed with the same intolerable radiance. It "popped" with a considerably louder and much more satisfying bang! The boy then turned and went over to the brook. He began slowly stirring the water with his stick.

Phrnnx found he could breathe again. The feathers on his back, however, did not lie down. All that remained of the invincible Yop battlewagon was the faint smell of ozone and a very large pile of fine multi-colored ash. This was patiently being removed by a small breeze.

The boy suddenly looked up, turned, and stared straight at where Phrnnx was crouching behind the bole of a large pine. He started to stroll over.

Phrnnx ran. He ran hard, fast, and unthinkingly. He was not sure what a "bad mans" was, but he had no wish to be included in that category—none whatsoever. No sirree. He ran in a blind panic with all four legs and a great sorrow that his ancestors had traded their wings for intelligence. Ahead, a dark, cavelike depression appeared in the ground. Without breaking stride, he instinctively



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threw himself into the protective opening.

And into the closet of the world.

Phrnnx awoke with the equivalent of a throbbing headache. He almost panicked again when he remembered that last moment before blacking out. A touch of the hard, unresisting metal underneath reassured and calmed him. He had thrown himself into a cave . . . only it hadn't been a cave. It had been a hole. A hole filled with machinery. Yes, that's right! He remembered falling past machinery—levels and levels and levels of it. He did not know it, but he had fallen only a mile before the first of the automatic safety devices had analyzed his alien body chemistry, pronounced him organic, alive, and reasonably worth saving, and brought him to a comfortable resting place at the fifty-third level.

He staggered to his feet, becoming aware of a faint susurration around him. Warm air, and the faint sounds of the almost silent machines. A slow look around confirmed the evidence of his other senses . . . and he almost wished it hadn't. Machines. Machine upon Machine. Massive and unnoticing, they throbbed with life and power all around him. He could not see the end of the broad aisle he stood on. He turned and staggered over to the edge of the shaft he had obviously fallen into, following the current of fresh air.

A quick look over the side made him draw back involuntarily. His race was not subject to vertigo, but there are situations and occasions where the reality transcends the experience. There is too much relativity in a cavern, even an artificial one.

Above stretched over a mile of levels, seemingly much like this one. Very faintly and far away he could just make out the tiny circle of light that marked the surface and his entranceway to this frighteningly silent metal world.

He could not see the bottom.

He found himself giggling. Oh yes, pastoral indeed! Quite. Not prepared to turn out war material. Certainly not. No capability whatsoever. No cities, remember? Handmade furniture. Quaint way to live. Didn't say by what kind of hands, though. Poor, degenerated natives! Cannon fodder, he'd seen it in Commander Rappan's eyes.

But the commander hadn't peeked in the basement.

When the hysteria had worked itself out, he took several deep gulps of the fresh air. There had to be a manual way out. Stairs, a lift, something! He had to get back and warn the others. He tried his pocket communicator, suspecting that it wouldn't work. It didn't. A communicator who couldn't communicate. He almost started giggling again, but caught himself this time. He began to search for a way out. He did not know it, and probably would not have cared anyway, but his situation



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was remarkably analogous to that of a very ancient and very imaginary Terran female named Alice.

"I am pleased to say," began the native known as Alexis Jones, "that the committee . . . government . . . ruling body? I forget the relevant term. Anyway, we have agreed to do what we can to aid your Federation. These Yops . . ." and he paused momentarily, "do not sound like very nice people . . ."

"They're not!" added Zinin fervently.

". . . And even if we only add a bit of manpower to your gallant effort, we will be happy to be of assistance. We are a bit," he added apologetically, "out of practice."

"That's all right," beamed the commander. At first he had regarded these disgustingly peaceful and soft-seeming bipeds more of a liability than an asset. Then it occurred to him that the Yops, too, were familiar with the Terran legends. Could be the materialization of a real legend might disconcert them a bit. Of course these peaceful mammals would have to be thoroughly instructed, or their appearance would merely make the Yops go into fits of laughter, but . . . "We appreciate your desire to aid in this great crusade. I am certain this historic arrangement will go down in history as one of exceptional benefit to all the races concerned. As a prelude to further discussion, I have ordered . . ."

He paused, open-mouthed, concentration broken. The Terran was staring upwards. His face had . . . changed. It was brightening, expanding, opening hitherto unsuspecting vistas to their startled gaze, like a night-blooming flower. With those two small oculars, previously so gray and limpid, there now glowed a deep-down fire that seemed to pierce upwards and spread over all present like a nerve-deadening drug. It made the commander draw back and Zinin hiss involuntarily.

"The Shield is Down!" shouted the native, flinging its arms wide.

"The Shield is Down!" answered his wife.

And all over the planet, among all the members, large and small, of the Brotherhood of Warmblood; the dogs, the mice, the cats and orcas, birds and shrews; ungulates, carnivores, herbivores, and omnivores, the great telepathic shout went up.

"THE SHIELD IS DOWN!"

And in the field Dobbin and the small brown dog began to discuss the ramifications at length.

The man turned to face his visitors, who were silent.

"You have done us a very large favor, gentlebeings, and we are oh, so grateful! How many years we labored to find the answer to the Shield, how many years, only to discover that it could only be applied, or retracted, *from an outside source.* Now that it is down, we will *not* make the error of allowing it to be put up again. Once again, gentle-



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beings, we are in your debt. Our agreement still holds. If you will return to your ship we will . . . commence preparations to follow in ours." The native smiled, and it was at once a lovely and terrible thing to see. (Among the known creatures of the universe, only the Terran human bares its fangs to express friendship.)

"It has been *so* long," the Jones sighed wistfully, "since we have had a decent war!"

Back on the *Tpin* it was a thoughtful yet jubilant Rappan who confronted a very bedraggled Communicator First.

"Commander," panted Phrnnx, "listen! You musn't drop the Shield! This whole world . . . it's a sham, sir! A fake. We've been fooled, and badly. These natives aren't as primitive as they'd like us to think. I *saw*, sir! Machines, automatic factories, synthetic food-processing plants . . . the *whole planet,* Commander . . . it's filled with their machines! I fell into it . . . accident . . . the machines down there are programmed to answer questions . . . I asked . . ." He paused for breath, became aware then that no one in the happy control cabin was paying any attention to him. Most of the crew were telling jokes, patting each other contently on their back-equivalents, and preparing for a lift-off. Only the Professor seemed unaffected by the otherwise universal giddiness. Phrnnx turned to the elder.

"Professor, I'm telling the truth! Tell them, make them listen, we've got to . . . !"

The Professor turned a spare eye on him. "Oh, I believe you, youngster. Yes, I believe you. If those *muftils* could control their glee long enough to listen to you, they'd no doubt believe you, too." He paused. "Have you looked at the sky recently?"

Phrnnx ran to a port and stared wildly upwards.

"The Shield's gone!"

The Professor favored his announcement with a first-degree nod, indicating positive acknowledgment. "Indeed it is. Commander Rappan had left orders with Commander Second Alo to drop it as a sign of good faith the moment the Terrans agreed to sign the mutual defense pact edicts with us." He looked thoughtfully at the port. "The Jones and his mate seemed to know exactly when the generating machinery on the satellite cut off. Even the animals were acting in a most peculiar fashion as we returned to the ship." He shivered slightly.

"I, for one, shall be less unhappy than I first thought at the prospect of leaving this place."

"What makes you think that, now with the Shield off, they'll hold to their agreement to help us?"

"Two reasons, youngster. First of all, the Jones said that they would, and I have a hunch that they are the kind of folk who put much in store by their word. And also, I kind of think they could have turned it off



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any time they wanted to, after our initial penetration."

Phrnnx did not answer. He was watching the sky grow darker outside the port as the ship rose beyond the atmosphere, watching the stars come out, remembering a picture . . . a little boy, two Yop scouts, and a battleship. Then a little boy and a battleship. Then just a little boy. And the machine that had soothed his traumas, deep under the crust of the planet.

"Sir," began Zinin to the commander, and his great voice was strangely muffled, "they're coming . . . in their ship, like they said they would."

Phrnnx yanked himself back to reality—if such it still could be called—and joined the others who were not occupied at the fore port.

Below. Great masses of puffy white clouds. Brown and green land masses, unchanged. Blue oceans, unchanged.

Except one.

In the middle of the planet's second ocean, great, impossible masses of thick columnar crystals began to leap upwards from the waters. Translucent at first, the chalcedony towers began to pulse with deep inner fires: blue, purple, gold, carmine, and finally a strange, yet familiar, silver-gray. The ionosphere, tickled, began to surround the flashing needles with auroras, clothing them in blankets of coruscating radiance.

Following, the planet began to move after the *Tpin.*

On board the cruiser it was very quiet.

"I see," whispered Rappan idly, "that they are bringing their moon along also."

"You get accustomed to something like that," breathed an engineer. "A moon, I mean."

Old Alo was making mystic signs with his tentacles. "Egg of the Code, I almost feel sorry for the Yops!"

The crew picked up this thread of awed enthusiasm as they began to relate the impossible sight to their own personal views of the war. In no time the mood of jubilation was back again, stronger than ever. Stimulants were broken out and passed among those who indulged in them. The communicators—excepting one Phrnnx—began to ply the space-waves with brazen, challenging messages, daring the Yops to locate them.

"Poor old Yops," whispered Phrnnx. "I can almost see Alo's point."

"Yes," replied the Professor. "There is only one thing that is worrying me."

"*What* is worrying you?" asked Phrnnx.

The Professor turned old eyes on him. They held irony, and they held musing.

"What," he said, "are we going to do with them when there are no more Yops?" ■



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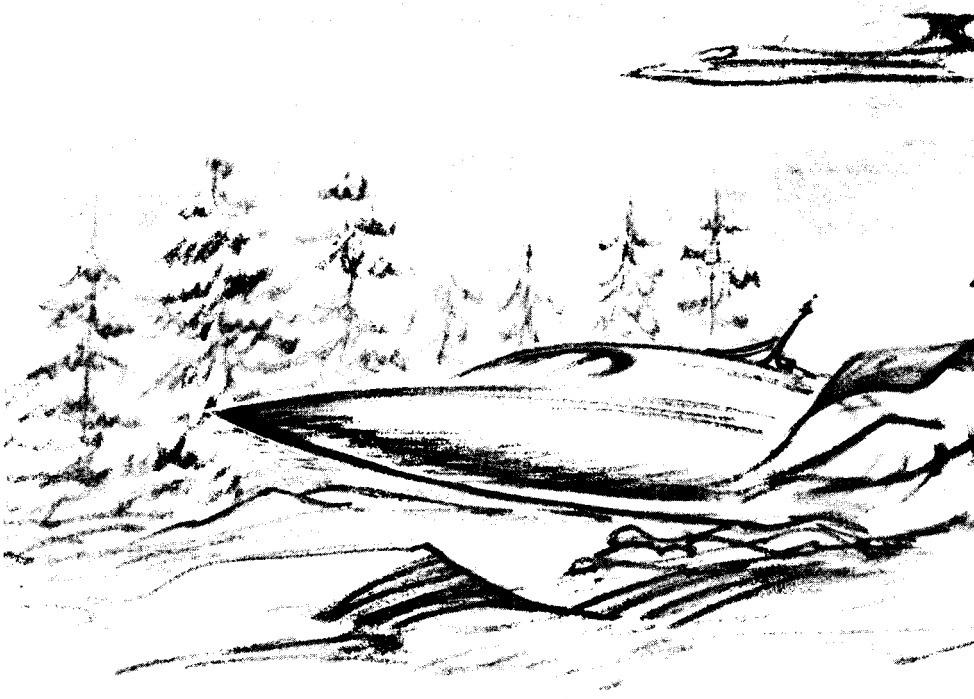

GORDON R. DICKSON

# *the Outposter*

Second of Three Parts. Bluff is well-known as a major factor in winning at poker. It's at least equally important in business and diplomatic deals. But it gets a little tough when your opposite number is an alien whose psychology and physiology you don't know!

*Illustrated by Kelly Freas*



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## SYNOPSIS

*The line of those cast out of Paradise is three miles long in the drizzling rain . . .*

*The cast outs are Earth-born people who had been picked in a continuous lottery to be Colonists on the new worlds off-Earth, whether they want to or not. In that long line there is every conceivable variety of human being. JARL RAKKAL is a brilliant young giant, scion of an ancient banking family, who has made a personal fortune for himself in publishing. Only to be tripped up and chosen in the lottery as a result of strings pulled by his banking relatives, who have been scandalized by his flamboyant way of life. LILY BETAUGH is a midget and an ex-professor of Philosophy at the University of Belgrade. AGE HAMMERSCHOLD is a master cabinetmaker who is overage for protection by his union, from the lottery. MAURA VOLS, the widow of a starship position astrogator, has herself learned position navigation among the stars, as a hobby. But all of these are lined up with the other lottery losers on one side of a long fence.*

*On the fence's other side, which leads to a different boarding ladder rising to a different entrance lock on the starship, is ULLA SHOWELL, daughter of Admiral-General JAS SHOWELL of Blue I Fleet, stationed at the Outer Navy Base in the area of the Colony planets toward which they are all headed. Ulla is arguing with the ship guards about wearing the regulation navy side arm that is required for passengers. Watching, is Apprentice Outposter Mark Ten Roos, just graduated from the Outposter Academy which supplies experts to live with, direct and protect the unwilling Colonists. He is returning hastily now to the Outposter station where he was brought up. His foster father has been badly crippled by a raid of aliens upon the Outpost and the Colony it protects. Mark sees that one of the guards talking with Ulla is arguing himself into trouble. To create a diversion that will rescue the man, Mark deliberately provokes Jarl Rakkal, on the other side of the fence.*

*Rakkal charges the fence, manages to get over it and attacks Mark with the skill of a man trained in* ki-fighting*—a school of unarmed combat. Mark, however, counters the* ki-stroke *with his own trained reactions, knocking Jarl out. Jarl is carried aboard, the guard is rescued, but Ulla Showell is left stunned by the event; and particularly so by the guard's refusal to take the unconscious Jarl to any place on the ship but the Colonists' hold.*

*The spaceship loads and lifts. In the dining lounge, the first day out, Ulla Showell meets Mark and apologizes for not understanding that Mark had actually saved Jarl's life. If Mark had not knocked the big Colonist out, the guards would undoubtedly have shot him. She invites Mark to join her at the captain's table. He does so, but a Meda V'Dan appears, one of the race of aliens who raid the Outposts and the Colonies, and whose depredations*



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*are winked at by the human Space Navy high command. Mark insults the alien, who complains to the ship's captain.*

*The captain is about to put Mark under arrest when a couple of veteran Outposters who are also in the dining room interfere. Mark is allowed to go free, but he is warned by the senior Outposter veteran against causing trouble he cannot handle on his own.*

*Outside the dining room, Ulla joins Mark and he tells her the reason for his reaction to the alien. The Meda V'Dan raided an Outposter station and killed his father and mother when he was a baby. He has been brought up as the foster son of an Outposter named BROT HALLIDAY. Ulla admits that she wants Mark, who as an Outposter has the right to visit the Colonists' quarters on the ship and she has not, to take her in to see Jarl Rakkal.*

*Mark does so—taking her along on a survey of the Colonists to see if there are any with special skills that would be useful at Brot Halliday's station—but the price he exacts is that Ulla use her influence with her Admiral-General father to lease to Mark four overage, small, Navy spaceships, ostensibly as scarecrows to keep the alien Meda V'Dan raiders away. Later, at the station when the Colonists arrive whom he has picked— including Jarl Rakkal, Maura Vols, Age Hammerschold and Lily Betaugh—he puts Jarl in charge of the station's economy, Maura in charge of training spatial navigations, and rounds up Colonists to whom he offers a chance to actually crewing the Navy ships.*

*For the first time he admits that he intends to use the ships to deal with the Meda V'Dan, if necessary.*

*He has just got these people to begin the study and work that will put the ships into space, when there is an urgent call from Brot—now a cripple in bed following a Meda V'Dan raid on the station that had been the cause of Mark's being summoned out to the station. Brot has wanted Mark to take over as Station Commander. Now, his call indicates that an Outposter named Stein—who was formerly Brot's second-in-command and ordinarily would have taken over the station instead of Mark—is with him.*

*Mark is jarred. Stein had quit and left the station when Mark arrived. Now the three other Outposters at the station admit that they invited Stein back, hoping what he saw would change his mind. Evidently it has not—and Stein is alone with Brot in the Residency.*

*Mark sets the vehicle he has been riding in motion, swinging it swiftly about on the grass and sending it sliding toward the Residency, only a few hundred yards away.*

## Part 2

### VII

They burst into Brot's bedroom to see Race lying still on the carpet, Stein behind him, standing with his



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back against a wall and his arms crossed on his chest, hands on opposite shoulders. In the bed, half-sitting, Brot held a gun in his one good hand resting the butt on his knee, the barrel pointed at Stein.

"Cover Stein!" snapped Mark to Paul.

He stepped quickly to the bed and took the gun from Brot's hand. Brot's face was white with exhaustion and he sagged back against his pillows as the gun left his hand. But the exhaustion had not reached that grim, inner core of him.

"Told you . . ." he whispered to Mark, "send Paul, Orv . . . not come . . . self—"

"Easy, Brot," said Mark.

He turned and went to the still figure of Race; but as he knelt by the downed man, Race stirred and tried to sit up, putting a hand to his head.

"I just gun-whipped him," said Stein. "He'll be all right except for a headache."

Mark got to his feet, facing Stein.

"What happened?"

Stein's eyes met his, across the room.

"I gave Brot a chance to take charge at the station here, again," Stein said. "He told Race to take my gun. I clipped Race instead. Turned out Brot had a gun under his pillow."

Race was on his feet now, if somewhat unsteady. He turned to Stein.

"Sorry, Race," Stein said. "Seems we've ended up on different sides, after all."

Race reached for the gun in his own holster.

"Never mind," said Mark, swiftly. Race's hand fell clear of his holster.

"Insubordination . . ." whispered Brot. "Shoot, Paul—"

"No," said Race, thickly. Paul had not moved. "Brot, you know we can't do that."

"No," said Stein. He kept his eyes on Mark. "It's up to you, Mark. Turn the station back to Brot, or over to Race. Otherwise, I'm going back to Sector Headquarters to charge Brot with incompetency and ask to have him replaced. The way he's cut up they won't hesitate—particularly when they hear the wild things you're trying to do here. One way or another you've got to be stopped. You're playing games with ten thousand lives at this station."

"They've been informed at Sector," Mark said. "The daily reports have gone in on schedule ever since I landed."

"Don't talk like a Colonist, Mark," said Stein. "You know I know how long it takes for anything from the daily reports to attract attention at the command level over at Sector. They're more than half Navy there."

He dropped his hands from his shoulders.

"Last chance, Mark," he said.

He walked toward the door.

"My gun . . . give me—"husked Brot.

"No," said Mark. Stein disappeared through the bedroom door.



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"Paul, you stay with Brot. Race—"

He looked at the assistant stationmaster.

"I'm all right," said Race. His voice was clearer.

"If you're up to it, then, come along," said Mark.

"Mark—"husked Brot, from the bed. *"Mark!"*

"Brot," said Race, "you know there's no other way. Make him lie back and rest, Paul. Give him a hypo, if you have to. Go ahead, Mark. I'll witness."

Mark went out the bedroom door and across the living room, followed by the loose-jointed brown man. They went out the front door together and saw Stein perhaps sixty yards away from the building, heading toward a small air-hopter. Race stopped; and Mark walked out from the Residency a half dozen steps.

"Stein!" he called.

Stein turned, jerking out his side arm as he spun about. Mark was already diving toward the ground and drawing his own gun. A heavy fist struck him while he was still in mid air, slamming him against the hard earth. Mist seemed to flood in around the blurring figure of Stein, and Mark felt the gun buck in his hand, as he got off at least a single shot.

He woke to a vision of whiteness, that slowly resolved itself into the view of a ceiling. He felt exhausted to the point of strengthlessness and the area of his left shoulder and chest was heavy and uncomfortable. He reached for it with his right hand and found himself thick with bandaging, there.

He lowered his gaze, digging his chin into his chest to look level; and saw the foot of his bed and then Brot's hospital bed with Brot sitting up in it, and Race, Paul and Orv all standing about. All four men were watching him.

"Stein?" Mark asked; hearing his voice come out almost as husky as Brot's.

"Killed," said Race. "Through the neck. A clean shot."

Mark felt a sudden, unexpected surge of emptiness and self-hatred wash through him. All at once, reasonlessly, he remembered Stein, and another Outposter whose name he could not now remember, taking turns carrying him about on their shoulders when he had been very young.

"I was aiming at his head," he said, faintly.

"Clean shots both ways." Race's voice seemed to boom in his ears. "He got you from above on your way down—the slug went in just by your left shoulderblade, then down and out just above your left hipbone in front. No important organs holed on the way through. You'll be up in a week or so. I gave it my witness—a fair and private dispute."

"I was aiming at his head—"whispered Mark. Whispering, he fell asleep.

He was up and around, as Race



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had predicted, in eight days. But he wore bandages for another two weeks. Meanwhile, the Colonists had been briefed on the changes that were taking place, by Race, speaking with the assistance of Paul, who had been back at the Earth-City the most recently of any of them except Mark.

The Colonists had also taken the briefings well. There was a minority, of older people mainly, Paul told Mark, who were fearful of what was being planned and done. But most of the Colonists had revealed a deep-lying hunger for change, any change, in their outcast situation. It was a little startling to Paul, even after six years on Post, to realize how the chance-dictated brutality of deportation from the Earth of their birth had rankled unchanged in some of the Colonists for as much as three-quarters of a lifetime.

As for Mark, he found that something had happened to him as a result of the death of Stein. He had lived with his determination to deal with the Meda V'Dan as long as he could remember. In all that time he had imagined all sorts of contingencies. But he had not imagined having to shoot Stein; and in some hidden part of his inner self there was now scar tissue where there formerly had been life and sensitivity.

Lying on his bed that first eight days and later while walking around still bandaged, he faced the fact that, if necessary, he would do the same thing again. But that did not soften the scar tissue, nor plane it away.

Luckily, he soon had other matters to think about. His bandages had barely come off for good, than Jarl came searching for him to take him back to the comptroller's building.

The building was now reroofed, walled, finished and furnished. A large tank-type integrator, back to back with a wide chart table, took up the center of the room. A few chairs and lesser calculators helped fill the remaining space between these two large items and the walls, which were hung with files of all types, from microspool through image cubes to chart-and-graph. Just at the moment, a clutter of papers and books hid the surface of the chart table; and on top of these were a number of small objects of straw, wood or native stone. It was to these that Jarl directed Mark's attention.

"There's your answer," Jarl said. "Native handiwork."

Mark picked up the nearest object, which was the crudely-carved wooden figure of a man sitting on a stump and sharpening an ax. Mark turned it over in his hand, examining it from different angles and then put it down again.

"Answer to what?" Mark asked.

"You wanted something to trade to the Meda V'Dan," Jarl said. The big man was surprisingly enthusiastic. "It's not only the ideal sort of trade stuff for us, it's the only thing we can afford to trade. I tore this Colony apart economically—past, present and future, right down to ev-



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ery nail in every building and every potato in every potato field. It can't afford to trade its old shoes, if it comes down to doing business in hard goods, the kind of thing the Meda V'Dan raid Outpost stations for, according to your records. All the light and heavy machinery, the instruments, the agricultural and industrial chemicals—trade any of that and we'll be in trouble. We don't have any to spare; in fact, we don't have enough for ourselves right now. But"—he gestured to the objects on the table—"this stuff!"

"What makes this so good?" Mark asked. Jarl looked at him curiously.

"You really don't know?"

"I've got an idea," said Mark. "But you're the one who has to sell me on whatever notion you've come up with. So tell me why."

"Well, look at it!" said Jarl. "All of it together hasn't got the value of a credit dollar. In short—it costs us nothing in real terms. Only the time and labor of the Colonists who carve, or build, or weave it. But we can trade it to the Meda V'Dan for the same things we're short of."

"Why?"

"Why?" Jarl stared at him.

"If there's no real value in it, why would the Meda V'Dan want it?"

"Because there's an unreal value in it—an art value!" Jarl said. "The Meda V'Dan may not have any use for it, themselves, judging by the way the records say they've reacted as individuals visiting the Earth-city, when they were introduced to human art back there. But they can turn around and trade these things off again at a profit to the Unknown Races farther in toward the Galaxy's Center!"

"And what makes you think that any of the Unknown Races would want these things?"

"Because somewhere down there, there's a race which appreciates art, and deals in it!" said Jarl, impatiently. "You've seen the sort of little gadgets the Meda V'Dan give as gifts to the brass at Navy Base. Stuff like that sparkle-cube, or whatever it was, Ulla had around her neck on the ship coming out here. Every time the Meda V'Dan've actually traded with the Colonies, they've traded the things the Outposters or the Navy asked for—tools, instruments, metals; practical things. When they raid Outpost stations that's the sort of thing they take. But when they give gifts, they give trinkets like Ulla's cube. Don't you see? They don't make the trinkets, or they'd be using them as a trade stuff with us. But they know some race that does—maybe several races. So they deal in *their* trinkets—and they'll deal in ours. Down toward Galactic Center there's bound to be aliens as interested in our native handiwork as we're interested in theirs."

He stopped talking at last; and stood, watching Mark waiting for Mark to answer. But Mark looked over at the handiwork on the chart table again before speaking.

"Maybe," he said, after a moment.



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Temper flared in the big man's eyes.

"Maybe!" Jarl echoed. "Here, I turn this Colony's assets inside out for you and come up with something out of nothing that's damn near a miracle—"

"I said 'maybe'," Mark cut him short. "Nine out of ten guesses about the Meda V'Dan have been wrong from the start, usually because whoever was guessing couldn't help assuming human reactions in alien minds. Maybe this is a wrong guess, too. All right, we'll try it out on the Meda V'Dan; but I'll believe it's working when I see it actually happening. Not before."

He went off, leaving Jarl fuming. But, once outside the comptroller's building, he turned to hunt up Lily Betaugh. He found her in the underground records room with one of the three assistants—the sociologist—that she had so far chosen to help her. Mark took her aside to tell her privately about Jarl's idea.

"What do you think of it—from what you've been able to put together about the Meda V'Dan so far?" Mark asked.

"I haven't put together much of anything, yet," said Lily. "What you asked me to do isn't something anyone can come up with overnight, or something I'd be sure enough about to announce without a lot of checking."

"All right," said Mark. "Then give me your opinion without being sure. What's your guess about the Meda V'Dan trading for our handiwork?"

"There're indications they do a lot of trading," she said, after a second. "And, of course, the more they trade, the more likely they'd be to trade in all sorts of different things."

He looked at her for a moment, thoughtfully.

"I think," he said at last, "the academic outlook you had back at Belgrade is slowing you down too much. This isn't a scholarly research project where you can take as many years as you want to work up conclusions. I want guesswork I can act on tomorrow—if not today. So suppose you forget everything else for a minute and give me the picture of the Meda V'Dan as you see them, now, without having all the evidence you'd like to consider."

Still, she hesitated.

"If you can't do this," he said—and heard a hardness of threat in his own voice that, unreasonably, started him thinking about Stein again—"you're no use to me here."

She lifted her small face to him.

"If I have to," she said. "All right then—the Meda V'Dan claim to look on us as primitive compared to them. They look down their noses at us. If they were humans, there'd be some reason to think that such an attitude was at least in part compensatory—and so not entirely justified. But they're not human and maybe this is a case where the human rule doesn't work. We know they're not very interested in spending any time at our



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Earth-city—even though a number of them have visited it with red-carpet treatment—and they definitely don't want any humans cluttering up their own world, or worlds. Also, they evidently can get along with a number of different races and cultures, since they trade with the Unknown Races as well as with us. But they seem to have no morals or ethics where their treatment of humans are concerned—witness their frequent raids on these Outpost stations, which their spokesmen immediately disavow. On the other hand, in order to survive as a civilization, they must have some internal rules system of their own. But no one seems to have any clue to what it is."

She broke off.

"Shall I go on?" she asked. "It's all like that. One bit of evidence almost contradicting another."

"No," Mark said. He was thoughtful again. "But get to work writing it up—as much as you can in the next three days; and I'll read it as I go."

She frowned up at him.

"Go where?"

"To talk to the Meda V'Dan, themselves."

"You can't be serious—"she was beginning, but he was already on his way out.

He went to the Residency to announce the same intention to Race; who stared at him and reacted with words parallel to, if not identical with, Lily's

"Go *now?*" asked Race.

"Why not?" said Mark. "Spal tells me he's got his Wild Bunch crews ready to lift and gun the scoutships; and Maura Vols can navigate for all four ships if we stay close together—meanwhile her students can learn by doing."

"But," said Race, "when they hear about this at Sector—"

Mark looked out a window at the green fields and the darker green of variform oak trees beyond. "The summer's going fast and I don't want to have to fight Meda V'Dan and winter weather at the same time. We'll get started right away."

## VIII

It was not a troublesome flight to the solar system under a GO star code-named K-39, where the Meda V'Dan were known to have at least one inhabited world. It was only slow; as Maura Vols agonized over her decisions and insisted on checking and rechecking her work each time before they made a position shift—five of which were required to bring the two scoutships Mark had taken to the periphery of K-39. Maura was proving unexpectedly stubborn about details. But she had shed her black wig and in spite of this, looked fifteen years younger under the natural gray of her own hair. It was not an unusual transformation among the Colonists as Mark knew. The rate of male die-off in a lottery shipment, once the Colony world was reached, was three times that of the female; and among the



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women who survived several often showed evidence of such an apparently reasonless rejuvenation.

Within three minutes of accomplishing shift into position by the K-39 system, however, they were challenged by Meda V'Dan ships.

"I'm the Commander of Abruzzi Station XIV, Garnera IV," answered Mark in human speech as soon as the talk-light beam between his ship and the invisibly distant Meda V'Dan ship was stabilized. "Outposter Mark Ten Roos. I'm here to give your most important person a chance to try and establish trading patterns with our independent Colony."

There was a short silence at the other end. Then the loudspeaker before Mark rattled in the heavy-syllabled Meda V'Dan tongue.

"I don't like your attitude," said Mark. "I'll make a point of complaining about it to your most important person when I talk to him. You don't seem to realize who you're talking to. I suppose I can't blame you. You Meda V'Dan have never encountered humans from an independent Colony before. If you know what's good for you, you'll take me to meet your most important person without any more delay, and with a decent amount of courtesy from now on."

The talk-light beam was broken abruptly from the other end. A moment later, six Meda V'Dan ships, each one several times the size of the two scoutships Mark had brought, appeared around them. Two of the alien vessels flanked the scoutships, the other four clustered behind. All six Meda V'Dan ships began to move forward slowly.

"We're under escort," Mark said to the other scoutship over his intership circuit. "Start moving—and keep together."

They moved off as a unit, the alien ships guarding the smaller human vessels like trout escorting minnows.

Turning from the screen, Mark caught sight of the face of Lily Betaugh, staring up at him.

"You can't talk to the Meda V'Dan like that," Lily whispered, glancing around to see that no one of the others in the scoutship command cabin were close enough to overhear. "It's just asking for trouble."

He looked back down at her, a little grimly.

"Don't anthropomorphize," he answered. "They've got no way of knowing how important I am. . All they know about human rank and authority is what other humans have told them—at Navy Base and back at the Earth-city. But the Meda V'Dan themselves don't tell the truth except when it suits them; how do they know the other humans told them everything—and told it right?"

She stood for a moment. Then she shook her head.

"It's still an awful risk," she said.

"Maybe," said Mark. "But everything that needs to be done has risk in it. And there's something you ought to keep in mind. They really



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don't know us any better than we know them; so anything's possible on both sides. Will you go ask Paul Trygve to join me up here from the rear gunpost?"

Lily went. A few minutes later, Paul showed up in the command room. He was the only other Outposter Mark had brought along.

"Paul," said Mark, pointing at the map-screen, "they're taking us in to the fourth planet of the system, just as we figured. When we land, I want to leave nearly everyone aboard but you, Lily, Spal and I. We'll make up a VIP committee to go in and talk to the Meda V'Dan in person."

"All right," said Paul; but he hesitated. "You're sure you don't want to leave at least one Outposter with these two boatloads of Colonists?"

"No. I may need you," said Mark. "Anyway, they might as well start now learning to get along on their own without an Outposter to fall back on."

The escorting alien ships brought the human vessels in to a fused-rock landing area just outside what appeared to be a city, in the Planet's northern hemisphere. There would have been no doubt that it was a city—as Mark and the others viewed it on their screens during landing—if it had not been for the remarkably uniform appearance and regular spacing of the buildings. These were windowless, dome-roofed towers of something like ten stories in height, rising out of what looked almost like a vast metal platform some five miles square and a hundred and fifty feet thick, its edges sloping down to fused rock all around the edge. Altogether, the appearance was more that of some monster machine than of an inhabited city.

Once landed, there was no further Meda V'Dan activity about the two human ships for nearly four hours. At the end of that time, a talk-light beam pinged upon the outer hull of the two vessels and an alien voice speaking in Meda V'Dan invited the Commander Outposter to come forth and be conducted to a meeting with the authorities, to whom he could explain his presence.

Mark and the rest of his four-person committee left their scoutship and found a small, floating platform vehicle, pilotless, waiting for them beside the ship. Once they had all stepped up on to its flat, metal bed, the vehicle began to move. It picked up speed as it headed toward the city, slid up the angle of the edge of the vast platform, keeping a constant altitude from the sloping surface, and moved on in among the forest of windowless buildings.

It stopped at last by the base of one of these and a door there slid downward out of sight to show a short interior passageway. Still, there were no Meda V'Dan to be seen.

"Come along," said Mark.

He led Paul, Lily, and Spal into the building. The door closed behind them, and another opened at the end of the short passage. They walked



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forward and through this new door to find themselves on a narrow, fragile-looking metal catwalk, soaring away ahead of them through girders and unlighted space, until it was lost in gloom. The second door slid shut behind them; and a small glow appeared about the metal of the catwalk, illuminating their way.

Lily made a short noise in her throat, halfway between a choke and a sound of retching.

"Hang on," said Mark. "You'll get used to the smell after a bit. Don't hold your nose or anything like that. They may be watching—and remember they don't think we smell like a bed of roses, either."

Still, Mark himself was tempted to hold his breath as he led the rest of them across the catwalk. The stink of the Meda V'Dan ship was something like the smell of rancid animal fat, with a sweetish, unnatural overtaste that caught in the human throat and seemed to cling there.

Somewhere in the gloomy mid-air, their catwalk intersected with another angling in from the left. All routes in the intersection were blocked but the one leading off to the right. Mark turned that way, with the others following; and perhaps a hundred feet farther on they came to the open entrance of another short passageway.

This led to a white-colored door that slid aside at their approach and let them into a wide room containing a very human-looking set of padded furniture. As the door closed behind them, a strong breeze began blowing from the walls; and, shortly, the native smell of the aliens began to diminish.

"They've had humans here, before," said Paul.

"Bound to have had," said Mark, looking around the room. "Brass from Navy Base, if nothing else. Any time now—"

A startled grunt from Spal interrupted him. The ex-marine had dropped down into one of the armchairs—to all appearance like any such piece of padded furniture made on Earth—and found it unyielding. What appeared to be spring-filled cushions covered with fabric was evidently only an imitation of such in some hard material.

Paul laughed; and reached down to put his hand to the nap of the apparent carpet underfoot.

"Like wire," he said to Mark, straightening up. "Wouldn't surprise me if it were wire." He went across the room to a farther door, which slid aside as he approached. He glanced into the room beyond. "At least we've got sanitary facilities. Unless they're imitation, too."

He reached inside and turned a tap on what appeared to be an ordinary enough human-style washstand. Water spurted into the basin below. Paul turned the tap off, wrinkling his nose. He stepped back into the room, as the door he had just leaned through closed once more behind him.



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"Their water smells, too," Paul said. He looked at Mark. "Now what? We just wait?"

Mark nodded.

This time the wait stretched out. Several times, Mark went back out through the obediently opening doors and back along the catwalk as far as the intersection. There he stood, listening. Occasionally, from far below there would be the faint, distant shivering sound of metal striking against metal, or a noise like that of a heavy weight dragged over a concrete floor. When he went back to the room, his nose had become so accustomed to the thick Meda V'Dan odor that the clean air of the steadily-ventilated room smelled flat and strange in his nostrils.

The fourth time he came back from such an excursion, his step was rapid and brisk.

"We've waited long enough," he said to Paul clearly and loudly as he came in. "Nearly six hours and we're here without food or drink. If no one's showed up by the time the six hours are up, we'll head back to the ship."

Less than ten minutes later, the door to the room opened of its own accord and a smaller version of the floating platform vehicle they had ridden on to the city entered the room. On its flat bed was a small stack of packages—Navy issue food and drink in decay-proof containers.

Spal stepped hastily toward it and Lily slid off the hard cushion of the imitation chair on which she had been curled up, with her legs folded under her. Mark put out a hand and stopped the ex-Marine.

"No," he said, his voice echoing a little from the walls in the silence. "I don't think so. We didn't come here to be fed issue rations. These Meda V'Dan have to be either pretty poor or pretty ignorant, to offer refreshment like this to us."

The platform hovered where it was for a few seconds longer. Then it slowly backed out of the room and was gone.

"But Mark," said Lily. "I'm—" She broke off as Mark's gaze came around hard upon her. She sighed and climbed slowly back up on to her chair. The other two men, watching Mark, said nothing.

After another dozen minutes, the door opened again. The platform floated back in, this time carrying several tall, sealed bottles and four of the large silver packages that held a complete meal each for a state-room-class passenger on a human spaceship.

"Better," said Mark.

Paul picked up the bottles one by one and looked at them.

"Rhine wine, brandy—" he said, "and bottled water." He helped Spal transfer the platform's load to the room's only table. Once unloaded, the platform slid quietly out.

The rest ate and drank hungrily. Mark drank lightly of the bottled water, only.

"You ought to eat," said Lily.

He shook his head, barely hearing



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her voice against the background of his thoughts, as he sat in one of the hard imitation chairs, a disposable cup of the bottled water in his hand. He was here at last among the homes of the Meda V'Dan after years of imagining how he would get here; and the reality of it had kindled a grim fire of exultation in him that was acting on his thoughts like an explosive stimulant. Ideas raced each other through his mind. He had to fight back the impulse to get up and pace the floor under the fever they roused in him.

The door to the room slid open.

They all looked up; and Mark got to his feet as a Meda D'Van rode into the room on a small platform vehicle. Like all the aliens, to human eyes he seemed identical with every other Meda V'Dan Mark had seen. His loose shirt was white with swirled black patterns, and his checkered pants were stuffed into high red boots, each of which had a chain of what seemed to be small, burning fires looped around each boot top.

"Ou'posser Com'der Mar' T'Roos," he said awkwardly in human, staring impartially at them all, "ozzer Lords and Cap'ins. Welcome."

"Thanks," said Mark—and the eyes of the alien swung around to focus on him for just a second before slipping aside to stare past his right shoulder. "Who've we got to thank for all this?"

The Meda V'Dan fell back into his own tongue.

[May thank me, human,] he said, in it. [In rightness all call me Lord and Greatest Captain He Of Fifty Names. Graciously I yield to importunities of humans clamoring the petition Most Important Person of the Meda V'Dan.]

His gaze shifted from Mark for a moment to flicker over the small figure of Lily, then return to station off Mark's shoulder.

[Not usual,] he said, [humans bearing their young among we of the Meda V'Dan. Nor are we sure are alien whelps welcome here.]

"You're talking about an adult," replied Mark. "This lady's an independent Colonist named Lily Betaugh. And she's not only grown up, she's a woman of wisdom—of philosophy."

"Phil'sss . . ." attempting to imitate Mark's pronunciation of the human word, He Of Fifty Names failed utterly. In Meda V'Dan, he added: [The sound is not known to me.]

"Philosophy," said Mark. "That which a people believe to be true about themselves and their relation to the universe."

[Ah—philosophy,] Fifty Names came up with a word Mark had not learned in the Meda V'Dan vocabulary.

"Is that it?" Mark said. "All right. She's a student and teacher of philosophy; and one of the reasons she's here is to learn about the philosophy of the Meda V'Dan."



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[That is easily told.] said Fifty Names. [The Meda V'Dan were old and rich when all other races were unborn and unconceived. The Meda V'Dan shall be rich and unchanged when all other races have died. For only we know the secret of the universe and will live forever; as we have already lived forever. Therefore, it is in the Meda V'Dan alone that we of the Meda V'Dan believe: and that is our philosophy. All else is supposition and error, that in which barbaric and short-lived races believe.]

"I see," said Mark.

[Good that you see,] said Fifty Names. [But there becomes in me an impatience. You have come searching out the Most Important Person of the Meda V'Dan for talk. Talk, then.]

"I intend to," said Mark.

But, having said that much, he said no more. For a long moment the silence grew in the room, then Fifty Names himself broke it.

[Human speech speaks of speaking but speaks no speech] he said. His words played versions on the active Meda V'Dan term for dialogue between alien and human, into what was either a joke or a sneer.

"That's because I'm still waiting for the Most Important Person to arrive," said Mark.

[I am here.]

"You're here," said Mark. "He isn't."

[To humans I am the Most Important Person,] said Fifty Names.

"Not to me," said Mark.

[Frail human with little ships. Do you try to insult a Lord and Greatest Captain of the Meda V'Dan?]

"As Outposter Commander of the Independent Colony of Abruzzi Station XIV on Garnera IV," said Mark, "I'm insulted to be kept waiting by a Meda V'Dan of lesser rank than should be talking to me. In fact, I'm just about out of patience. I told the Meda V'Dan on the ships that intercepted us that they evidently didn't realize whom they were talking to. Evidently you don't know either. We'll be leaving."

He turned to the other three humans.

"Let's go," he said; and walked toward the door, which opened before him.

[Humans will leave when given leave, not otherwise.] The alien voice followed him.

"We'll leave when I say so," said Mark, still walking toward the door, "interfere with us in any way, and the Meda V'Dan will never deal with another human being again."

He was at the door.

[Pause,] said Fifty Names. [There may be a misconception here.]

Mark stopped in the doorway and turned about, to look back at the Meda V'Dan. He did not come back into the room, however; and, after a second, Fifty Names stepped down from the platform.

[A misconception,] he said, [may exist.]



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"But not on my part," said Mark.

[The possibility exists that I have been wrongly informed by the Lords and Great Captains of the ships which met you as you came close to our sun,] Fifty Names said. [If this is so, they are criminals and no better; and they will be punished for this as soon as they can be identified and apprehended. Unfortunately, they had all left this solar system on business of their own before I was told you were waiting here. But if we can find them, they will suffer—]

"Never mind," said Mark. He still stood in the doorway. "I'm not interested in unimportant individuals, but in your Most Important Person. If I can't see him shortly, we're leaving."

[You will see him.]

Mark turned and came back into the room.

"Sit down again," he told the other three; then turned his attention back to Fifty Names. "How soon?"

[It is impossible to tell—wait,] said Fifty Names, as Mark turned once more toward the door, [but perhaps an hour of meeting can be found and established. Not precisely—]

"It'll have to be precisely," said Mark.

[Possibly, possibly it can be precisely determined.]

"And it'll have to be soon. We've waited longer than we should already."

[Soon,] said Fifty Names, [as soon as possible.]

"Now," said Mark.

[That is not possible.]

"Then," said Mark, "we're leaving, now."

[If you leave, you leave.] said Fifty Names. [Now is not possible. Not even in a little while is it possible. Not even if He of Most Importance wished it, would it be possible in any case other than an emergency for all Meda V'Dan. He is our Most Important Person and his duties are many.]

"In six more hours then—at the outside," said Mark.

[Impossible. Three days at the least.]

"I'll make that eight hours," said Mark. "But we're not staying here any three days."

[Possibly . . . just barely possibly . . . he might speak to you, if all things go well, in under two days.]

"No," said Mark. "Eight hours—all right. Ten hours. But at the end of ten hours we lift our ships."

[I tell you, human—and I am a Lord and Greatest Captain among the Meda V'Dan—he whom you wish to speak to is not merely of this universe, but in part of another. He is not to be summoned in a moment to an unknown meeting. If I died for it, he could not be spoken to by you in under sixteen hours.]

"Ten," said Mark.

[Sixteen.] said Fifty Names. [Go if you wish.]

"We'll wait ten, then leave," said Mark.

[Very well. I will try to bring you to him in less than sixteen. But I promise nothing, and expect nothing. Nor should you.]



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Fifty Names stepped back up on the platform vehicle, and it carried him out. The door closed behind him.

"Sixteen hours," said Paul, looking after the alien. "Maybe we should go back to the ship."

"No," said Mark. He looked around the room, and spoke to the walls. "We'll need bedding. Blankets. And some way of controlling this lighting so that we can darken the room for sleeping."

In less than twenty minutes, the platform vehicle returned with a neat stack of white Navy blankets and two small, brown pillows whose antecedents were obscure. A panel opened in the wall to the left of the door, revealing a rheostat-like control knob; and Mark, experimenting, found that it was possible to dial the illumination about them from darkness up into a brilliance that made them shield their eyes. He turned the control back down until the room was in a dimness only slightly brighter than that of the gloom about the catwalk outside.

There were enough blankets so that they could make pads to protect themselves from the stiff fibers of the imitation rug, and still have a blanket apiece left to wrap themselves. When they were all rolled up in their blankets but Mark, Mark turned the lights down into total darkness, and then felt his way back along the wall to his own pad and blanket.

He was busy there for some little while; then he felt his way across to where memory told him Spal was lying. The ex-Marine woke at the touch of an exploring hand on his face.

"What—" Spal began. Mark put his hand over the other's mouth, choking off his voice.

"Quiet," Mark breathed in the short man's ear. "Listen now, and don't talk. Hang on to your covering blanket, but climb up on my shoulders, when I get to my feet. Once you're up, wrap the blanket around you so it hides me completely. Got that?"

Mark removed his hand from Spal's mouth.

"Yes," whispered Spal.

He obeyed. It was slow and clumsy in the darkness; but in a couple of minutes, Spal was riding Mark's shoulders and the blanket the ex-Marine had wrapped around his shoulders cloaked Mark from view.

Once Mark felt the blanket around him and the smaller man firmly on his shoulders, he started to work his way by memory back to the wall, and then along the wall to the light control. He almost missed it, but feeling the edge of the door sent him back with surer aim. A moment later he had it. He turned the light up until it was barely possible to see Spal's now-empty pad, the two blanket-wrapped forms of Lily and Paul, and a blanketed shape huddled against the wall where Mark's own sleeping position had been.



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Mark turned, balancing the weight of Spal on his shoulders. Peering out through a crack of an opening where he held the two edges of blanket together before him, he headed toward the small, blanket-wrapped figure of Lily. When he got there, he saw that she was wide-awake and watching him without moving.

"Get up," he whispered.

She tossed the edge of her blanket back and stood up.

"Come on."

He turned, again carefully, and led the way toward the door of the room, which opened before them. Together, the three in the guise of two went down the corridor and out on to the walkway.

It was a more than slightly effortful distance to the intersection of the two walkways for Mark, carrying the weight of Spal. When Mark reached the intersection, he pressed up against the railing next to the barrier that closed off the intersecting walkway, and gradually squatted down under the blanket until Spal's feet touched the walkway floor on each side of him.

"Just stand here, both of you," Mark murmured from under the blanket. Easing out from beneath Spal's legs, he opened the blanket a crack. One of the barriers and the dark stretch of barred-off walkway beyond, was inches from him. The barred-off walkway did not glow, and its shape seemed to vanish in the gloom less than a dozen feet from where he squatted.

"Stand here for fifteen minutes after I go," he whispered. "Then go back to the room and lie down. Come back out here three hours from now and if I'm not here, wait for me. Did you get that?"

Spal grunted affirmatively, overhead. Clinging closely to the shadow of the barrier itself, Mark slipped out from under the skirt of Spal's blanket and squeezed through a small gap between the barrier and the railing of the barred-off catwalk. He continued to crawl forward on his stomach down the dark catwalk floor until he had covered some distance. Then, he paused and looked back.

Spal and Lily were twenty feet or more behind him, two disparate, blanket-wrapped shapes, staring out over the railing of their little catwalk at nothingness. Mark checked his wristwatch. The glowing hands stood at 1:17. He got to his feet and ran softly forward another fifty feet before he straightened up. Then he slowed to a rapid walk.

Shortly thereafter he came to a circular stairway, coiling downward. For a second he paused at the head of it, looking tensely in all directions about him. From below came up the faint, distant, momentary sound of metal against metal.

Then, he took hold of the railing of the stair, and went down into darkness.

## IX

As he descended, he counted the



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steps. When he had reached the number of sixty-seven, his descending foot jarred on a different surface. Looking down and around, he saw that he had reached an intersection with another catwalk which soared off into darkness on either side of him.

It was almost completely dark, here—but not quite. From somewhere a vague general illumination prevented total obscurity, so that he was surrounded by a sort of heavy twilight. Farther below, there was an additional, vague glow of illumination; but either the atmosphere was naturally misty or the lower light was baffled in some fashion—because he could not see much beyond thirty feet in any direction. His nose was all but numb to the Meda V'Dan odor now; but it seemed to Mark that here the air felt thicker in his lungs than it had been above.

He continued downward. Another sixty-seven steps of descent brought him to a second catwalk. He paused and calculated. The steps before his face were very close to eight inches apart. One hundred and thirty-four steps that far apart would place him one thousand and fifty-two inches, or almost eighty-eight feet below the level of his starting point, which was level with the entrance from the city-platform, through which they had entered the building earlier. He should now be, therefore, some eighty-eight feet "underground"—if that term applied here—but still almost seventy feet above the level of the fused rock area on which their scoutships had been escorted to a landing.

Obscurity still yawned below him; but the occasional sound of heavy weights dragging on a coarse surface, or of metal shivering against metal, were much louder now. The stairs continued downward; and so did Mark.

But now, as he descended, the illumination from below grew stronger; and gradually he began to make out shapes in the darkness below him. These grew from vague outlines to reveal themselves as tall stacks of various objects, like the crates and materials in a warehouse; and with the last of another set of sixty-seven descending steps he set foot finally on a solid floor, surrounded by high piles of things.

The floor was metallic, and it rang more hollowly where he had first set foot on it at the bottom of the staircase, than when he took his first step away from the stairs. Looking back and examining the point where the staircase appeared to end, he saw that it did not. It descended instead into the floor; and below the bottom tread was what seemed to be something like a trapdoor with a circular handle. He took hold of the handle and tried to lift the door—but it was either locked or too heavy for his strength. He gave up the effort and turned away to examine the nearest stack of objects.

These turned out to be a set of oblong shapes about the size and gen-



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eral appearance of coffins. But when he tried to lift one that was not imprisoned in a stack, it very nearly floated into the air at his touch. The objects, whatever they were, were almost as light as air-filled balloons. But he could find no seam or crack in them which suggested that they might be opened, and their use as objects in themselves was unguessable.

He moved on, finding each stack different, and equally incomprehensible until he came unexpectedly upon a small pile of the same white Navy-issue blankets that had been provided above for their bedding. As he was making a rough estimate of how many blankets there might be in the pile, there was the shivering sound of metal on metal right behind him.

Turning sharply, he was just in time to step back as one of the miniature platforms floated by him, either towing or being pushed by a low, treaded vehicle with what seemed to be a number of long, jointed, grasping arms sprouting from its top surface.

The platform was already carrying several objects; and, as it passed, one of the jointed arms from the treaded vehicle picked something more from a stack opposite the pile of blankets.

Then both platform and treaded vehicle moved on.

Mark followed them. Their pace was not slow, and he had to jog to keep up with them. Together, they collected and loaded on the platform several more objects before steering away among the stacks to come up against the wide, soaring surface of a wall, in front of which some sort of conveyor lift-belt was in continuous upward motion.

The burden of the platform was transferred to the steadily upward moving arms of the conveyor lift; and the two automated vehicles moved off. Mark stepped closer to examine the lift.

Like the staircase, it, too, went down through the floor of this warehouse-like area in which he stood. But unlike the staircase, there was an open area where the belt and arms rose up through which it was possible to see. Mark got as close to the belt as he could and gazed downward.

He stared into a vast area equal in size to the warehouse floor in which he stood and possibly a hundred feet deep within its massive circular wall. This space was dwarfed only by the massive, enigmatic metal shapes, half a dozen of them and all similar, that were held in mid-air, in the room's centerpoint, by massive girders. There were no automatons, like the platform or the loading machine, to be seen below, or any sign of Meda V'Dan, but the brilliance of the illumination that revealed everything in stark detail was eye-stabbing to Mark's dimness-accustomed pupils. The scene blurred with tears as he looked at it, and he drew back to



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slowly blink his vision clear again.

When his eyes had stopped tearing and dilated once more to the point of being able to make use of the dim light of the warehouse section, Mark looked at his watch. Incredibly, the hands stood at two minutes to four. The three hours he had mentioned to Spal and Lily were almost up.

He looked about him. He was not lost with respect to his starting point, which had been the foot of the staircase, in spite of his roundabout movements in pursuit of the platform and the loading vehicle. Part of memory training at Outposter's Academy had been the envisioned reference grid on which in unfamiliar territory a graduate automatically counted his steps and turns in order by mnemonic device. Standing by the conveyor, now, he summoned up the grid image in his mind and ran mentally through the chant of numbered steps and turns he had taken since leaving the ladder's foot.

Envisioned, his path built itself as a white line by jogs and turns and loops from center point A1 to an ending at square MNP 93. The direct line between those two would lay out a route of two hundred and eighteen feet at twenty degrees inclination to the base line of the wall now at his back.

There was no doubt he could find his way back to the staircase. But in routing himself around the stacked materials, he would take time; and then there would be the slow, hard climb up a hundred and eighty-one eight-inch steps back to where Spal and Lily waited. At a rough estimate he would be close to forty minutes overdue by the time he reached them; and he did not have confidence in the level-headedness of either one of them that would insure their not becoming impatient and doing something foolish that would attract the attention of the audio and probably visual monitors the Meda V'Dan obviously had on their human guests.

Mark looked at the steadily rising arms of the conveyor belt. Then, he turned about and caught hold of a rising arm, stepping with both feet on to the one below.

The belt carried him upward. In a moment, the scene of the warehouse section floor was lost in obscurity once more below him. He was enclosed in gray twilight, moving up through nothingness beside an endless wall-surface that vanished in the darkness above, below and on both sides of him.

The ride seemed to go on an interminable time. He glanced at his watch, at the glowing second hand sweeping its dial; and it seemed to him that the hand was moving very slowly.

Then, there was a glimmer of light—a small spot of yellowish illumination directly above him. He approached it rapidly, and it grew in brightness, until he saw it as a manhole-shaped opening in a darkly solid floor above, through which the



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conveyor belt was now carrying him.

He crouched down, tensing himself for quick action in the face of whatever he might find in the light above.

The conveyor belt lifted him through. He had a glimpse of a reasonably-lighted room as he leaped clear of the belt and landed, ready, with his back to a wall. But there was no one living in the room. Only a floating platform and a loader standing motionlessly by. Mark breathed deeply. Whatever activated the automated vehicles, it was not simply a matter of weight on the conveyor belt.

He straightened up and took a closer look at the room. It was almost more a passage than a room—long and narrow, reaching to a white-painted door at the far end. Toward the door end, was either a small window or a vision-screen pickup. He went toward it.

It was a vision screen all right, with a control knob below it. Currently, it showed only darkness; and from somewhere about or behind it, an audio pickup brought him the sound of someone undoubtedly human breathing slowly and deeply, just on the verge of snoring.

He reached out, touched the knob and turned it. The darkness gave way to the view of a short, empty passageway leading to a green door. He turned the knob again and saw the end of a lighted catwalk leading from a door. He continued to turn the knob and the view moved outward along the catwalk until it reached an intersection with an unlighted catwalk, where two figures, one large, one small, wrapped in white blankets, stood waiting.

Mark hesitated. Then he tuned the screen back to its view of the dark room and turned toward the door at his left. It slid open, revealing what was apparently a section of blank wall. But this, too, slipped aside, and he stepped through into the same corridor he had been viewing a second before on the screen.

He turned about in time to see the wall section close behind him once more. Closed, it looked as immovable as any other wall-part in the passage. He turned and walked openly out on to the catwalk and along it until he came up behind Spal and Lily.

"Time to get back to sleep," he said.

Lily gasped. Spal did not start, but he turned about with a swiftness that was surprising.

"Mark!" Lily said. "How—"

"We don't talk here," he said, quickly and sharply interrupting her. "Come on, both of you."

He led the way back to the room, paused inside to dial the lighting up to the minimum level of illumination necessary for them to find their way back to their blanket pads on the floor. As he reached his own corner, Mark looked over at Paul.

Paul lay breathing the calm, heavy breaths Mark had heard over the audio pickup connected with the vi-



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sion screen, but the other young Outposter's eyes were steady with question.

Mark shook his head imperceptibly, shook out the blanket he had bunched up to make it seem that he was still on the pad, beneath, and settled himself seriously for sleep.

And, in remarkably short time, actual sleep found him.

He woke with a start to the sudden glare of light in his eyes and the sight of Fifty Names—or at any rate, some Meda V'Dan wearing the same black-and-white shirt that Fifty Names had worn when Mark had last seen him—standing over them. Mark came to his feet by reflex, swiftly followed by Paul, and more slowly by Spal and Lily.

[By fortunate and unusual chance,] said Fifty Names, [He of Most Importance will face you briefly, now.]

"We'll be right with you," Mark said. "It'll take us perhaps five minutes to get ready. Wait outside—and turn off your sight and sound surveillances of this room."

[Now is now.] said Fifty Names. [There is not time to wait.]

"Meda V'Dan," said Mark. "We'll come when we're ready—in five minutes, or not at all. Wait outside and turn off your surveillance."

[If He of Most Importance knew of this, I could not do it.] said Fifty Names. [At my own risk I give you the time you ask for.]

He turned and rode out on the platform on which he had entered.

"Only," said Mark, looking after him, "I'll bet they go right on watching and listening to us."

He stepped to the table holding the remains of last night's meal and poured himself a cup of the bottled water that remained.

"Now's your chance to freshen up, if you want to grab it," he said to the others. "And you'd better grab it. No telling when the next chance's coming. Lily first."

Lily went off into the adjoining lavatory room and the door closed behind her. The other two men joined Mark at the table. Paul filled himself a cup of the water. Spal reached out to close his fist on the brandy bottle, then hesitated, glancing at Mark. When Mark said nothing the ex-Marine put the bottle to his lips and swallowed three times.

They were sharing some of the rolls and butter left over from the package meals when Lily rejoined them to make her own breakfast from the remains. Mark nodded Paul toward the lavatory.

Five minutes later, they stepped through the door of the room to find Fifty Names waiting in the passageway. An extra, empty floating platform nuzzled the one on which the Meda V'Dan himself stood.

[The Commander will ride with me] Fifty Names said. [Others, on the second vehicle.]

Once aboard, the platforms skimmed through an opening which unexpectedly appeared in a wall of



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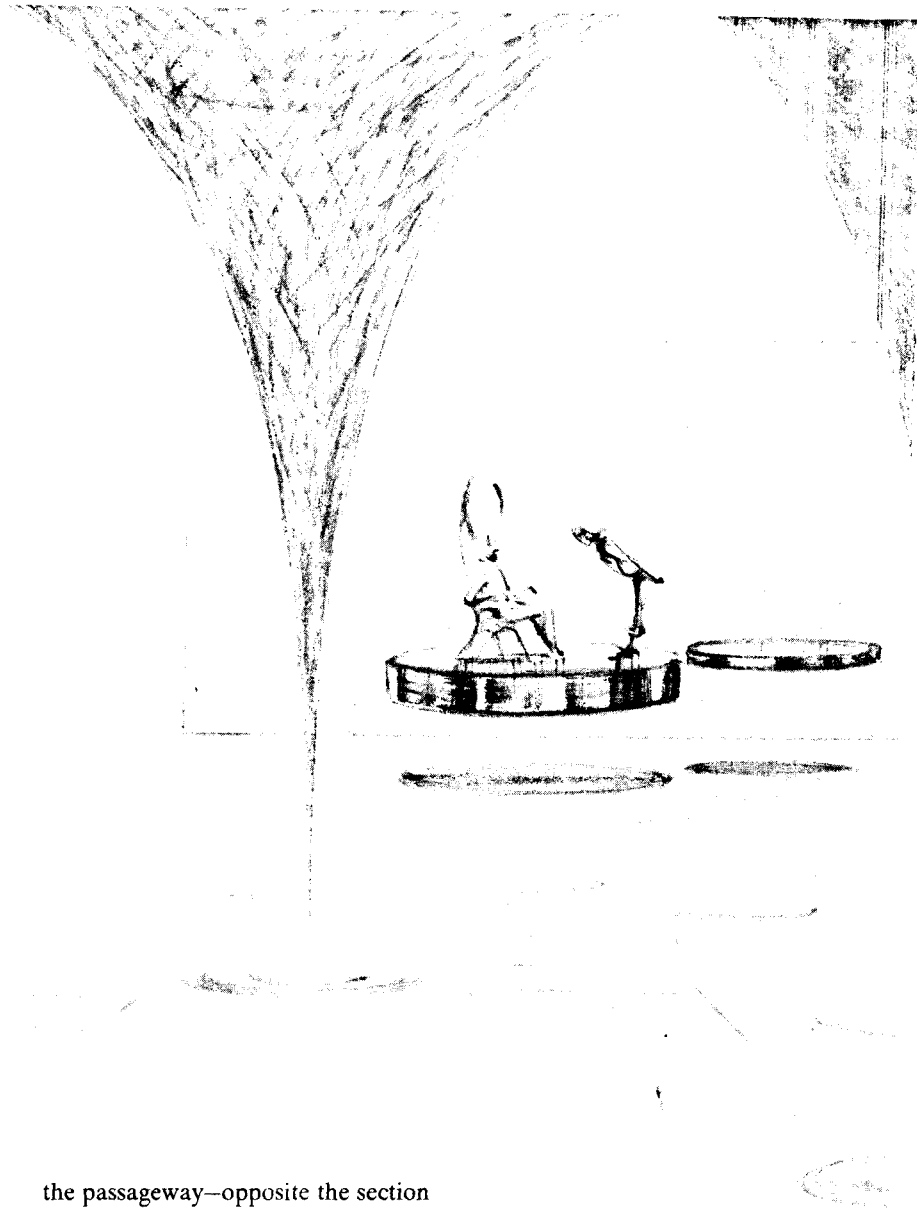

the passageway—opposite the section of the wall that had moved aside to let Mark back into the passage the night before. They found themselves in a long, curving passage down which the platforms slid with increasing speed, until they were forced to decelerate so as to stop before an opening in a vertical shaft.

One by one, the platforms floated



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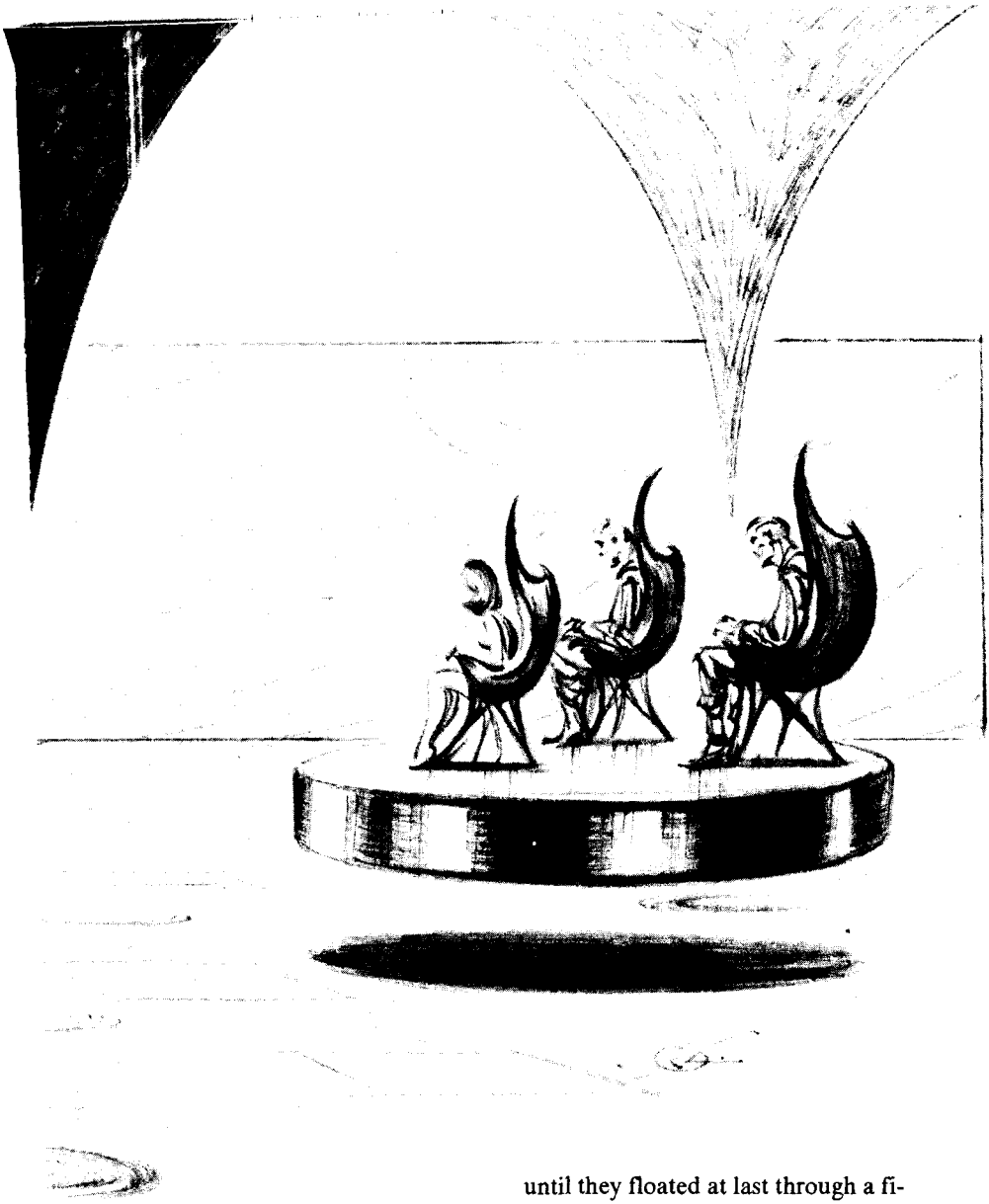

up the shaft to a higher level. Then followed a quick, dizzying trip through several intersecting passageways and short changes in level until they floated at last through a final opening into an enclosure the size of a large ballroom. At opposite ends of this room were what looked like two daises about fifteen feet square and six feet high supplied



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with metal chairs with harp-shaped backs and saddle-shaped seats. The platforms floated to the nearest of these daises.

[You will rest here, all of you,] said Fifty Names. He waited until they had stepped up on to the dais, then swept away on his platform to the dais at the opposite end of the room, and stepped up to seat himself in one of the metal chairs there.

Mark himself sat down and the others followed his example. The metal chairs were not as uncomfortable as they had looked at first glance.

"Now what?" asked Paul.

"I guess we wait," said Mark, ". . . after all."

But the wait was not long, at that. Within a few minutes, the wall behind the other dais slid aside and a Meda V'Dan wearing boots, loose pants and shirt all of pure white, without ornament or design of any kind upon him. This individual took the chair beside Fifty Names and stared across the perhaps eighty feet of distance at the humans.

There was a moment of silence and stillness. Then the walls of the room opened in a dozen places, and several dozen Meda V'Dan ran out, one of them carrying what looked like a silver rod, pointed at both ends. Shouting, the one with the rod tossed it to another, who fended off the approach of a third and tossed the rod again. They ran back and forth in the space between the two daises, yelping, struggling for the rod and throwing it to one another. Gradually, the struggles for the rod became more violent. Scratches from the pointed ends brought blood to the faces and hands of several of the players. Then—without warning—the activity ceased. The shouting stopped. In a moment the players had all returned within the walls and the walls themselves had closed up again.

Abruptly, the dais under Mark and the others began to move. It slid forward toward the other dais which was also in movement now, approaching from the other end of the room. The two heavy-looking structures swept toward each other until they were no more than twenty feet apart, then stopped. Mark squinted a little at the face of the Meda V'Dan figure in white. They were not quite close enough for him to make out fine details in the other's features; and it struck him that, even if he had been able to read expressions on the face of a Meda V'Dan, the distance was just enough to prevent this also.

The Meda V'Dan in white turned his head toward Fifty Names and his lips moved. There was no sound to be heard on the human dais, but Fifty Names tilted his head as if listening, then straightened and looked across at Mark.

[He of Most Importance,] said Fifty Names, [says that your unfortunate circumstance is known to him. If the renegades who destroyed the Station of your parents at your birth



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and destroyed your parents also are ever discovered, they will be severely punished.]

"Thanks," said Mark, dryly. "I take it then that this search has been going on ever since then?"

[I am the voice of He of Most Importance,] said Fifty Names. [It has been without cease.]

"I'm glad to hear it," said Mark. "But it wasn't about that that we came here to talk."

Once more the head of He of Most Importance turned to Fifty Names, and his lips moved.

[I, who am Most Important among the Meda V'Dan, know why you have come,] relayed the voice of Fifty Names. [It is a happy moment to see you here, amicably among us. The trade of humans is always welcome to the Meda V'Dan. But you need not have come just for that. Already, we were prepared to visit you at Abruzzi XIV before long and trade for tools and hardware much demanded of us by other inferior races like yourselves.]

"It's not tools and hardware we're interested in trading," said Mark. He turned to Spal. "Let's have the box."

Spal unhooked from his belt the small leather box containing the samples of Colonist handicraft Jarl had earlier shown to Mark.

"Put it on the platform, there. Better open its top, too. They might not know how." Mark pointed to the platform vehicle that had carried them to the dais and still floated alongside it. Spal rose from his chair and knelt down at the edge of the dais to place the box gently on the platform with unlocked and bent back cover.

The platform slid away with its load in the direction of the other dais, where Fifty Names picked it up, unpacked its three small artifacts from protective padding, and passed them one at a time into the long-fingered hands of the figure beside him. He of Most Importance examined them one by one, as the platform floated back to the human dais.

"In the interests of setting up a new trade line with the Meda V'Dan," said Mark, "we're willing to trade the first shipment at a fraction of the price we'd have required from our own people back in the Earth-city. Five of your flame hand-weapons for each work of art."

The fingers of Most Importance, holding up the small wooden carving of an elephant and turning it about to inspect it, halted for a fraction of a second at the sound of these words. Then, casually, the fingers began to turn the carving about again.

The procedure of inspection was repeated with each of the objects and they were passed back into the hands of Fifty Hands. Most Importance turned his head, and his lips moved.

[These are crude toys,] relayed the voice of Fifty Names. [A spaceship full of them would not be worth one flame hand-weapon. They are of no interest to we of the Meda V'Dan.]

"Perhaps not to the Meda V'Dan,"



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said Mark. "But to a good many of the races farther in toward the center of the galaxy with whom the Meda V'Dan trade, these rare art objects, each one hand-fashioned individually by one of our race, are priceless. I'm surprised to hear you answer like that. If you don't want to handle them, we'll send ships in to these other races and take the extra profit of the trading ourselves."

For a moment after that statement, Most Importance did not move. He continued to sit, absolutely still, staring at Mark. Then slowly his head turned to Fifty Names, his lips moved.

[I have never heard of a human that talked so wildly,] said the voice of Fifty Names. [Your little ships would not be able to make the trip down-galaxy to where the inner races begin to be found. Nor would you know where to find them, or how to trade with them if you did. Only the Meda V'Dan know the skills of trading with many different races; and we know it because we are eternal and have lived so long that no people are strange to us. You are young and ignorant. If you try to trade with the inner races, you will only die in trying.]

"Want to bet?" said Mark. He got to his feet. "Sorry we couldn't agree. Possibly, later on after we've set up trade with the Unknown Races, we'll share some of it with you Meda V'Dan for a commission."

He looked at the others, who had imitated him automatically and were now also on their feet, waiting.

"Come along," he said, and stepped toward the edge of the dais above the platform.

[Wait,] said Fifty Names. [You are leaving now?]

Mark stopped, and looked toward Most Importance.

The lips of the white-clad Meda V'Dan moved.

[Stay,] echoed the voice of Fifty Names. [We, who achieve to the position of Most Importance among the Meda V'Dan, are more sensitive than ordinary individuals. I sense your deep disappointment; and I share the sorrow I feel in you that you have come this distance only to fail. In charity, we will take a token consignment of sixty-seven of these primitive objects and in return, that the name of our goodwill to trade continue to be known, we will give you a dozen of our used flame handweapons.]

Mark stepped back to his chair and sat down again, motioning the other three to follow suit.

"Thanks for your attempted kindness," he said. "But we wouldn't want to take advantage of you if you really don't realize the worth of these art pieces. Also, valuable as they are, of course we couldn't consider giving them up for at least the price I mentioned. Perhaps, just to show our goodwill, in turn, I could add three extra pieces for no price at all. Merely as gifts."

There was a small sound from the direction of Paul's chair—something



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very like the noise of a choked-off snort of laughter. Mark glanced grimly at the other Outposter, then back at Most Importance.

[The Meda V'Dan, in their wealth and power,] answered the voice of Fifty Names, [give gifts, but scorn to receive them. Possibly, in recognition of your faith in these small things, the dozen hand-weapons we offer could be brand-new, rather than used . . .]

The bargaining began in earnest.

## X

"I'm sorry, Mark," said Paul, once they were safely back aboard their scoutship and both small vessels were back in space. "I didn't plan to laugh, back there. But when you mentioned gifts, after what they've been doing with the Navy Base people, it got me. It wasn't so much what you said, it was watching those two Meda V'Dan have to sit there and take it with a straight face."

"That's all right," said Lily. "But can you be sure they'll stick to the price they agreed to, if we meet them with the sixty-seven new pieces of handicraft?"

Mark nodded at three of the so-called "flame" hand-weapons—actually nothing more than projectors of tiny incendiary slugs, but slugs capable of generating a heat explosion of close to a million degrees.

"They paid for the three samples," he answered. "And to get them to part with arms of any kind's a victory. There wouldn't have been any sort of trade if they hadn't decided at first glance they could make a profit on the pieces. Jarl was right."

A wave of exhaustion swept through him. He was suddenly weary with a dead weariness that turned even this victory to a drab accomplishment. He took a hard grip on his thoughts.

"I'm going to get all our reactions down on tape while they're fresh," he said. "Spal, Lily, I want to check out with you anything you saw or figured out about the Meda V'Dan from seeing them close up like this—"

He paused, and blinked to clear his vision. A pearly mist was beginning to obscure things around him, and his balance was suddenly unsure. He put out an arm to steady himself against a bulkhead . . . and the next thing he remembered, Paul was helping him into a chair in his cabin.

A hand appeared with a glass partly full of a dark liquid, holding it to his lips. Automatically, he drank and the fire of unmixed liquor seared his throat and gullet. He choked, sputtering and pushing the glass away.

"What the hell's this . . . this—" Mark finally got out.

"It's our own whiskey. Drink it," said Paul, holding the unfinished liquor to Mark's lips in spite of Mark's efforts to brush it away. "Then you can get some sleep."

Mark gave up and drank what was



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left in a single fiery and effortful gulp.

He sighed with relief, leaning back in his chair. The shock of the whiskey had burned his vision clear again. He saw the furnishings of his cabin and Paul standing over him, Spal over near the door.

"I'm all right," he said.

"Sure," said Paul. "Just out on your feet. Sit there a minute until that hits bottom; and then we'll be able to trust you not to think of something new to do instead of sleeping."

"Don't worry about it," said Mark. "I know when I have to quit."

"Sure," said Paul. "How do you feel now?"

Mark considered himself. He felt no reaction from the whiskey at all, he thought. Only a sense of pleasant lassitude that was beginning to nibble at him.

"Better," he said. "You're right. I need a few hours. Don't worry—I'll turn in."

"All right, then," said Paul. He went out, Spal with him. Mark continued to sit where he was, feeling the lassitude grow and spread comfortably within him. He ran his mind back over the events in the Meda V'Dan city. Much of it would need thought and talking over to gain the most from. The great thing was what he had seen through the conveyor-belt lift hole in the floor of the warehouse section . . .

The door to his cabin clicked shut. He had not heard it open. He looked over to see Lily coming toward him, carrying in both hands a tall, white, coffee mug. She had changed from the ship's coveralls she had worn to visit the Meda V'Dan into something that looked like a pink-colored pajama-robe combination. It must have been something she had brought from Earth. Possibly, he thought a little fuzzily—the whiskey was, he recognized, beginning to take hold after all—she had decided to turn in, herself. She looked like a living Dresden miniature of a woman, carrying the large cup to him. She put it into his hands.

"What's this?" he asked. The cup was hot.

"Soup," she said. "You've got to eat something, sometime. Don't argue. Here, hold it." She let go of the cup and deftly climbed up to sit on the arm of his chair; then took the cup back again, and held it to his lips. "Drink it."

He tasted the steaming liquid cautiously. But its temperature was bearable. It was a thick, meaty soup of some sort and after the first swallow or two, he found he was ravenous.

"I can hold it myself," he said. He took the cup from her and drank in small mouthfuls.

"You're strange," she said. He could smell the hint of some light, flowery perfume from her, and almost feel the warmth of her small body against his left arm and shoulder. A little fuzzy from the whiskey, he enjoyed it. "You're very strange.



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You drive yourself like somebody twice your age and twice your responsibilities."

"Duties," he answered.

"Duties?"

He leaned against the back of his chair, to ease the weight of his head on wobbly neck muscles.

"Duties," he said, hearing the word sound a little blurred on his tongue. "Everyone's got duties. Mine began a long time ago—a long, long time ago."

"To your parents," she said softly. Her small hand pushed back the dark hair that had fallen forward on his forehead.

"No," he said, "to a race of fools."

Her fingers rubbed soothingly across his forehead.

"They aren't all fools."

"No," he said, half lost in his own memories and thoughts, "if they were I could let it all smash up and forget it. But there're a few good people, like my father and mother. Like Brot . . . and my duty's to them."

"And not to us Colonists?"

"Colonists!" The word growled, deep in his throat. "Oh, nothing against you, personally, Ulla—"

Her fingers stopped moving on his forehead.

"Who?" she asked.

"Lily," he said. ". . . Lily. Got mixed up, with all those l's. Women with l's in their names . . . Anyway, the point is it's not just Colonists. There were two thousand Colonists watching the night the Meda V'Dan burned our station and killed my folks—and not one of them did a thing. Against maybe fifty of the aliens."

"What could they have done?" Her fingers were back, moving rhythmically across his forehead and back, again.

"Anything . . ." he said. "But nothing. That's why it's not just my folks. It's not just the Outposters or the Colonists . . . it's all of them. The whole race of damn fools—and nobody to save them from their own mess but me."

He twisted his head a little awkwardly to look up into her face. Somehow, while he had been talking, she had slid off the arm of the chair until she lay with the light weight of her body pressing against him. He was suddenly conscious of the womanness of it. He tried to focus on her face, but she was too close. All that he could bring into focus were her two blue eyes, which were watching him solemnly from inches away.

"Lily . . ." He reached across with his right hand to lift her back up on to the arm of the chair, but at the touch of his hand, the thing she was wearing fell apart open down the front as if it had never been fastened, and the naked skin of his wrist and forearm pressed against her skin.

The contact was like an explosion in him—an explosion of everything of him that was young and had been long under pressure. But then, even



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in the second in which he picked her up and got to his feet, the tidal wave of all he had worked and lived with as long as he could remember came pouring back into that area the explosion had temporarily blasted empty.

He looked down at her savagely, thinking how easy it would be to give in now—to the first small break in his purpose that would lead to further cracking and final disintegration. From here he could slip back into the captured mass of humanity, accept the fetters waiting for him on the community chain, and sink out of sight back among the rest of those helpless in the grip of their historic time. He could, but he would not; and for a moment he stood, feeling the bitterness of his purpose and the equal bitterness of what it denied him.

He put her gently on her feet on the ground and automatically she gathered her clothing together about her. Her face was pale now, except for two spots of feverish color high on each cheek.

"I'm human, too" she said.

Fury boiled up in him.

"I'm not!" he said. "What's the matter with you? I'm an Outposter. You're a Colonist. Do you think I can be different with one Colonist from what I am with the others? If I do, the whole thing breaks down!"

His voice lowered on the last words.

"Get out of here," he said, grimly. "I've got to get some sleep."

The color had come back into her face. She smiled at him and her eyes were almost luminous.

"Yes," she said softly, "you sleep, now." She backed to the entrance of his cabin and then she was gone.

He stood, looking at the door that had closed behind her. The adrenalin of his explosion had all drained away now. His head was no longer fuzzy from the whiskey; but he felt numb all over, heavy as a dead man in all his body and limbs. He turned, sat down on the side of his bunk, and pulled off his boots. Falling back on the bunk, he pulled its single cover up over him; and fell asleep instantly.

He woke from heavy, prolonged slumber just as the scoutships were setting down from orbit around Garnera IV. There was no time to debrief Lily or Spal now on what they might have learned respectively about the Meda V'Dan philosophy or military potential during the visit just past. He went out and took command of the ships during the landing.

There was a Navy courier ship—not much smaller than one of the heavy scoutships—already on the field before the station when they landed. Mark glanced at it briefly as the jar of landing went through the vessel he was in; but his mind was elsewhere, now. He put in a call to the Residency building before leaving the scoutship.

Race's lean brown face appeared



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in the screen almost immediately.

"Go well, Mark?" he asked.

"I think so," Mark said. "Want to get all the Outposters—and Jarl, too, come to think of it—in the Conference Room at the Residency? I'll be there in a few minutes."

"They're all already here," Race said.

"Fine. How's Brot?"

"Better," Race said. "He'll be there, too."

"Good." Mark broke the connection.

By the time he left the scoutship, Paul and the others had already gone. But an empty ground car had been left waiting for him. He got in it and drove up to the Residency.

When he stepped at last into the Conference Room with its open-centered ring-shaped table, he found there not only the other Outposters and Jarl Rakkal, but Ulla Showell. She got quickly to her feet from the chair where she had been sitting talking to Jarl, as Mark came in.

"Excuse me," she said. "I'll step out. I just dropped in on your station to see how Jarl was doing."

He looked at her grimly.

"You chose a bad time for it," he said.

Her face tightened.

"A bad time?" she echoed. "Why?"

"Because the Meda V'Dan'll be hitting this Section within twenty-four to seventy-six hours, unless I'm badly mistaken," he replied. He looked about the room at the faces of the others as they reacted to his words. "That means we've got less than twenty-four hours minimum to get ready to fight them off."

## XI

There was no sound or movement in the room. They were all looking at him.

"Mark," said Paul, after a moment, "are you sure? I mean. You didn't mention anything about this—"

"I meant to as soon as we were back aboard," said Mark. "But it seems I ended up taking a small nap and not having the chance."

He turned to look directly at Ulla, who stared back at him, then started as if just wakened from an involuntary trance.

"Excuse me," she said again. She crossed the room and went out.

"But what makes you think they'd attack?" Paul said as the door closed behind her.

"The fact I made the trip deliberately to stir them into doing just that—among other reasons for going," said Mark. "And I'm pretty sure the trip did it. Now let us sit down."

They moved to the circular table and took seats around its outer rim. Brot, now in a mobile power chair, was slid into the gap in the ring-shape that gave access to its open center and inner edge.

"Paul," said Mark, when they were all seated, "have you had a



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chance to tell them about the trip, itself?"

"I covered the gist of it," said Paul.

"All right, then I won't waste time doing the same thing," Mark said. He looked around at the other faces. "We got safely into the Meda V'Dan space area and city and out again because the aliens couldn't be sure how much of the appearance we made was the truth or not. I acted as if we had authority and importance, both; and the fact we showed up in a couple of Navy-type vessels but without any Navy uniforms on our leaders, made them cautious about calling any bluff I might be making. Then, it turned out we really had something they could use in trade—"

He broke off, looking at the big Colonist.

"Thanks to Jarl, here."

"Thanks to you for saying so," said Jarl.

The hard voice of Brot broke in on the Colonist, indifferently.

"But why should they hit us?"

"Because there's no point in their trading for those pieces of art work we offered them if they can just take them," said Mark. "And also, because they don't like being bluffed any more than we do. One of the reasons I crowded them into talking business with us as soon as possible was because we were working against a time limit. The minute we showed up there, the way we did, they must have sent at least one ship to Navy Base to find out what the Navy knew about us. They were bound to come up with the information that the Navy had leased us the scoutships—and that'd be proof enough we didn't have any spacegoing fleet of our own. Their next move is obvious—hit us and settle the matter. And maybe wind up with a valuable haul."

"And you're telling us you deliberately provoked the Meda V'Dan into something like this?" Race demanded.

"That's right, Race." Mark looked across the curve of the table at the other man. "Because I wanted a chance to burn them; and teach them the lesson that it's a bad idea to raid Garnera IV's Abruzzi XIV station. When they come, we're going to be ready for them. I took only two ships to visit them, deliberately; and we'll leave two ships standing in the field. The other two we'll crew and lay off, armed and waiting just below the horizon. We'll set up an orbit watch, to give us warning of their coming; and evacuate the station, itself. Also we'll set up gun posts in the woods around the station—anywhere there's cover—and that'll include use of the four fixed plasma rifles out of the two ships we leave in the field for them to see. We'll have to dummy up some kind of imitation rifles to mount on the ships we take them from."

He looked over at Orval Belothen.

"You can raise us some kind of crew out of the village factories to do that for us, can't you Orval?"



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The round-faced Outposter nodded.

"There's a good new Colonist in the furniture factory named Age Hammerschold," Orval said. "He can probably cut you wood imitation plasma rifles that'd fool anyone at fifty feet with a little paint. That is, if there's time enough, and I can get him to work steadily. He's a little unadapted yet. Mutters to himself and sits around a lot."

"All right," said Mark. "Then let's get down to details on the rest of it."

They spent the next five hours talking over plans. It was not until after dinner that Mark could find time to get together with Brot and Spal, in the small building at the station Mark had required to be built to hold the station weapons and a small toolshop for their repair and maintenance.

"What did you learn about the Meda V'Dan we could use—if anything?" Mark asked the ex-Marine bluntly.

Spal shook his round head.

"Not much," he said. "In fact—not really anything. You know they didn't take us where we could see anything military."

"I told you beforehand," said Mark, "they wouldn't do anything like that. I asked you to use your eyes, anyway; and see if you couldn't figure out anything from what you did see."

"I know," said Spal. "I tried. But there's not much you can tell from what they showed us. In fact nothing, really."

Mark looked at him for a moment.

"Spal," he said, "I brought you to this station and gave you this job—which is a lot better job than you'd have got if you'd just gone through general assignment to some other Colony. I did that because I thought you could be useful here. If you're not going to be useful, you can move out to one of the Section villages tomorrow. Now, I'm not asking you what you saw. I'm asking you to tell me what the things you saw might mean, as far as the Meda V'Dan's ability to fight goes. Stop for a minute now, and think. Then see if you can't come up with something to justify the job I've given you."

Spal hesitated.

"There's . . . nothing," he said, his voice tight. "That's the truth. There just isn't anything to tell you. Oh, that town of theirs isn't built to be any kind of a defense point; but what can I tell about what maybe they've got hidden away there in the way of armament."

"Just a minute," said Mark. "What's this about the Meda V'Dan city not being built as a defense point? What do you mean?"

Spal shrugged.

"Well, it's plain enough to see," he said. "Those buildings of theirs—and most of the stuff in them—aren't heavy and thick enough to stand up to for more than a few seconds of heat from even the small fixed plasma rifles on our scoutships. You



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noticed how flimsy everything was built? They don't have any protection from the terrain, like being down in a cup-valley or something so they've got hills around to give them a high horizon; and they're deliberately built out in the flat open, with the ground even slagged around them. If they've got real weapon power tucked away out of sight there, it doesn't make sense laying themselves out in the open like that; and building with such light metal they'd lose a lot of their city even if they drove off or killed an attack force."

"Hell," put in Brot, "maybe they're so sure they can knock off an enemy before he even gets close that they don't have to worry about getting damaged. Maybe they've got some kind of weapon tucked away we've never dreamed of."

"When I was in the Marines, our Intelligence people didn't think so," said Spal. "And anyway—they've not only built as if they didn't worry about being hurt. It's almost as if they deliberately hunted up the most open, defenseless place to build in."

"Maybe there's something close by they need," grunted the crippled station commander.

"No," said Mark, "I was looking for signs of civilization on the planet as we went in; and I didn't see any, except for that one city. There's nothing around it, either, not even what you might expect in the way of farmland. Did you see anything else, Spal?"

"No, nothing at all," said Spal.

"Maybe, all this time, they've just had an outpost there," Brot muttered.

"Pretty big for just an outpost," said Spal.

"I think so, too," said Mark, thoughtfully. "That city was big enough to hold at least a million Meda V'Dan. Ten square miles of ten-story buildings just about as close as they can be packed, means a lot of buildings."

"If they live there," said Brot, "they've got to have some way of feeding themselves."

"They're omnivores, like us," said Mark. "You know, when they raid, along with tools, equipment and weapons, they usually take any stored grain or harvested agricultural products. And they've been known to trade for agricultural products. Assuming they get part of the nutriments they want from outside, mainly the carbohydrate part, they could grow their protein indoors under laboratory conditions. In fact, with all the evidence of technology they've got kicking around, that might be the easiest method, for them. We know they can eat our food in a pinch—as long as it isn't seasoned in any way; but no human I ever heard of knows what their food looks like. It could be almost completely synthetic."

"Why?" asked Brot, bluntly. "Why synthesize when growing's simpler?"

"I don't know . . ." said Mark. "But if they do, the reason for their



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doing it could tell us a lot about them. Particularly if we could find out why they build the kind of city they do, and tie the two reasons together."

The three of them talked a while longer; and Mark tried to stimulate Spal to additional useful deductions about what he had seen, but without luck. They split up and Mark went to see Lily, in the underground records room.

He found her working alone there, recording a report on what she had seen on the Meda V'Dan visit. She smiled up at him and switched off the machine as he came in and took a chair facing her.

"You're pleased," she said.

"You've got a little more in the line of imagination and initiative than Spal," he answered. He told her what Spal had been able to come up with in the way of observations upon the Meda V'Dan.

"How about you?" he wound up. "What were you able to deduce about the philosophy and character of the Meda V'Dan?"

"I'm sorry," she said—and she looked sorry as she said it. "I'd like to tell you I came up with something vital and unknown about them; but I didn't. Oh, I'll get together with my assistants and we'll go over this report I'm doing and see if they don't come up with something useful psychologically, or sociologically, from what I saw and remember. But all I can really tell you about the Meda V'Dan after seeing them is: one, they scare me silly; and two, I don't see how you can be so sure you can bluff them the way you did."

"They bluff, too," Mark said.

"I suppose they do." She stared at him, her small face serious. "But I certainly didn't get the feeling they were bluffing. I got the feeling they believe everything they say about themselves."

"Such as?"

"Well, that business of their being an old race when our race was young," she said. "The business of being older than any other race in the universe and that they were going to go on living even after we were dead."

He looked at her sharply.

"You didn't tell me you could understand Meda V'Dan speech," he said.

"If you'd asked me on the ship coming out here, I'd have told you," she said. "I didn't think of it then, as something that might help to get you to choose me. I didn't think of it at all until you put me to work to find out about the Meda V'Dan. Then I was a little afraid to tell you because, to tell the truth," she hesitated, "I don't really understand the language all that well. It's just that I picked up a sort of working knowledge of it, along with a lot of other languages I was learning so I could read and appreciate the philosophy of the people who spoke them. And it got to be something of a hobby with me."

"I see. All right," he said, "but the



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point is you believed the Meda V'Dan about this business of their race living forever? Because of some secret they had, wasn't it?" She nodded. "Why? What made you believe them? That's the sort of thing any race might like to think about itself."

"I don't know . . ." she frowned. "It's just that it seemed to fit in. I suppose it was just a subconscious reaction of mine to how it seemed to match with everything else there. The idea of their having a secret and living forever seemed to tie up, somehow, with the way they were what they were, and with the way they lived. It was only a feeling; but I had it."

He was watching her closely.

"Well, hang on to it," he said. "Think about it some more and see if something in the way of concrete evidence doesn't come to mind. One of the things I learned from Wilkes Matheison—he was my tutor, back at the Earth-city—was that the hunches of a trained observer are likely to be a lot closer to the truth than anyone untrained would guess. An experienced observer picks up all sorts of little signals from an observed situation without being consciously aware of them as specifics, Wilkes said. And from what I've seen, he's probably right."

Mark got to his feet.

"Can't you stay a while?" she asked.

"Too much to do," he said. "we've got a week's work to get done in a couple of days and nights; and I need to be on top of everything that is done."

He went out.

He had not exaggerated the work needed and time required to do it. In fact, it was accomplished with perhaps fifteen minutes to spare. He was sitting slumped in the chair at his desk in the unlighted Residency office two and a half days later, dawn graying the sky above black clumps of Earth-imported pines beyond the tall Residency window, when Ulla Showell came to find him.

At the sound of footsteps, Mark looked up, numb with fatigue through all his body, but his mind clear with that abnormal, last-ditch clarity that comes shortly before the point of physical collapse. He saw her standing just beyond the desk, the white dress around her slim young body seeming to float by itself in the dim, dark room, illuminated only by the dawn-gray windows.

"They told me you'd headed for bed," she said. "So I looked for you in your room, first. When you weren't there, I guessed I'd find you stopped somewhere along the way."

"I said I was going to bed to shut them up," he answered. He pointed a finger toward a chair alongside the desk, facing him. "Sit down."

He reached wearily for the light button on the desk.

"Leave the lights off," she said. "It's peaceful here in the dark."

He nodded, drew back his hand



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and let it drop off the desk-edge on to his knee.

"Why don't you go to bed?" she asked.

"I'm still awake," he said. "And there are still things to be done."

"There'll always be things to be done," she said.

"Yes."

He was too tired to ask her why she had come looking for him. He simply waited.

"I wanted to talk to you under better conditions than this," she said stiffly after a moment, almost as if she were making a speech. "I've learned a lot since I came out with you on the *Wombat.* Particularly, I've learned about the Navy Base." She was looking slightly past him as she spoke, and the expression on her face was a little obscured by the darkness; but her body was stiffly upright and she held her hands folded in her lap. "You probably think that is strange. Maybe you don't even believe me—but I've never had any idea of what an Outer Navy Base was like. I've lived all my life in Earth-city and the Base was just some place my father went off to for several months at a stretch, from time to time."

"I'd heard things of course," she said. "But I never believed them. I do now. I understand now why you Outposters call the Navy Scarecrows. I don't know—maybe I understood it a long time ago at that, but just didn't want . . . anyway, I want to marry Jarl Rakkal."

He said nothing. After a second, she went on.

"You're an acting Outposter station commander. You can marry people. Married to me and back on Earth, even if he's come back illegally, Jarl'll be an embarrassment to the whole Colony system. Enough, anyway, so that—maybe this once they'll make an exception and give him back his citizenship. At any rate, we want to try it. You marry us, in a week or so a small spaceship will put down in a quiet corner of your station and take both of us off, and I'll arrange to meet any price you want to name for doing it."

Still, he said nothing. She stopped looking past him and looked directly at him.

"Well?" she said. "You *can* marry us, can't you?"

"Yes," he said. "But I won't. I can also approve the marriages of my Colonists—and I won't approve Jarl's."

"Why not?"

"I need him," Mark said.

"I told you," her voice was controlled, but just on the edge of passion, "I'd pay any price you want—credit, old Navy ships, equipment, anything!"

"We're past that point," Mark said. With an effort, he pulled himself into a more upright position in his chair. The day was breaking fast; and now he could make out not only the expression on her face but the dark shadows under her eyes. "We've got to the point now where



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we need to make our own way as a Colony. For that, we need Jarl."

She closed her eyes like someone undergoing an operation without anesthetic.

"You really don't want Jarl," he said, then.

Her eyes opened suddenly.

"You've talked yourself into wanting him," Mark went on, "because you want him to substitute for what you used to believe in—your father, the Navy, the Earth-city people, everybody. You think you can't believe in people in general, any longer; so you're trying to believe in Jarl as an exception to them—someone innocent, a victim of a tragic situation needing a just rescue—to prove there's still some good in the race after all."

"And what's wrong with that?" she said.

"Only the fact it's false," he answered. "There's no more tragedy about Jarl Rakkal's being lotteried than about any other Colonist. You'd do better with the truth—go back to believing in people as they really are."

"Who can believe in people as they are nowadays?" she said furiously.

"I can," he said.

She stared at him, her lips still parted as if she had been about to say something more when he had checked the words in her throat.

"*You?*" she said, after a moment.

"It's why I do what I do," he said. "People-worship's not a bad religion, once you get over the idea that your god-object's there to serve you, instead of so you can serve it. Just don't expect them to act like gods just because you've made a god out of them. The important thing is to save lives and souls, not that they lie, cheat, take bribes or kill—or that they'll turn on you when they don't need you any more and hang you high in the sun as a warning to anyone else who thinks the worship of them is a soft and easy service."

She did not answer. With the preternatural clarity of his fatigue, he saw that he had finally managed to shock her into a state where for once what he said might get through to her.

"Think bigger than Jarl," he said, "and have the guts to face the fact that ordinary people can do extraordinary things. You'll end up far ahead, and happier in the long run."

He took hold of the desk edge with both hands and hauled himself to his feet.

"And now," he said, "you ought to be out of here and over in the trenches behind the trees away from the station, like everyone else. I'll take you over."

She got numbly to her feet and he escorted her out to the ground car outside. They were halfway across the open ground to the trees when the warning siren whooped.

## XII

Mark wrenched the controls of the



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ground car; and it jerked about, almost throwing Ulla out. She clung to the handrail on the firewall before her as the vehicle raced toward a different patch of wood some three-quarters of a mile from the station buildings. They slid in among the trees, leaving a trail of dust and disturbed ground litter like smoke in the air behind them. Mark jerked the car to a stop beside an open, circular pit about five feet deep in which Paul sat, surrounded by a ring of sensory equipment hastily pulled from its proper building back at the station.

Mark jumped from the car before it had actually stopped shuddering from the hard, back air-blast that had halted it. He dropped into the pit beside Paul.

"What've you got?" Mark asked immediately.

"Three," answered Paul without looking up. "Coming up planetary in orbit around east sunside, velocity four, acceleration none, mass eighteen."

Mark glanced into the scan cube and saw the three points of light to which Paul referred. An orbit velocity of four and no comparable acceleration of the three Meda V'Dan ships would mean that they had already killed their interworld true speed and achieved orbit on the night side of Garnera IV. They were coming around to the dawn line by calculation just when that would put them over Abruzzi XIV station. At mass eighteen, they would be ships about double the size of the Navy scoutships—and, it went without saying, with five to eight times the offensive weaponry.

Mark reached past Paul's shoulder to unhook the command phone and call the entrenched plasma rifles taken from the two scouts still on the landing area before the station. Paul was busily juggling his controls to keep the orbiting Meda V'Dan in scan—they were still a good ninety degrees or so below horizon line of sight—and he swayed his body sideways to give Mark access to the phone.

"Guns?" Mark said, into the mouthpiece of the phone.

"Mark Ten Roos. Three bandits, expected at—"

He glanced at Paul.

"Fourteen minutes," said Paul. "Thirteen . . ."

"In about twelve minutes," said Mark, "count from now and dropping. Spal?"

"Sir," said the voice of the ex-Marine from a speaker box before Paul. "Both plasma rifles and crews ready to fire."

"Fine," said Mark. "Don't fire until I tell you. We don't want to warn them off until you can get a good shot at them."

"Understood, sir."

"Fine. Ships?"

The voice of Race answered, from one of the two hidden scoutships.

"Sir."

"Orval?"

"Sir." The voice of the other Out-



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poster sounded from the second ship.

"You've heard the transmission," said Mark. "Three bandits moving this way from orbit in now ten minutes and minus. Don't move until I call you airborne; then hold air, but below the horizon until I give you the attack word. Stay a good two miles apart and don't try to take on anything more than a wounded ship close to the ground. The bandits are double your size and any one of them could chew you both up in half a minute at five hundred feet of altitude. Stay low. Follow orders. Understood?"

"Understood." The answer came back from both Outposters at once.

"Hand-weapons," said Mark.

"Sir," responded the harsh voice of Brot. "I've been listening. All groups of gunmen dug in and ready."

"Thank you, sir," said Mark. "Wait for orders."

"Understood."

"Stand by, all," said Mark. He took the phone from his mouth and looked once more at the instruments in front of Paul. Glancing up from this, he saw Ulla still sitting frozen in the ground car.

"Get down here," he called to her. "Down inside; and sit with your back to the side of the pit, out from underfoot."

She moved to obey; but he was already back studying the instruments by the time she reached the pit's floor.

"What's the readout?" he asked Paul. Paul glanced at a silvery tape with black numbers on it, slowly spewing out of a slot in a box near his feet.

"Can't tell much," Paul answered, after a second. "Large fixed weapons both fore and aft on each ship, of course. No index on smaller weapons yet—too much distance. They'll have to drop down from orbit before we can be sure of smaller guns."

He fell silent. The minutes ticked off.

"Here comes the first one now," he said. "Others at interval—"

His words were drowned out by a thunderclap of sound. Instinctively, all three of them at the command post jerked their heads back to look upward. High against the clear, cloudless brightening blue of the dawn sky was a black speck, almost directly overhead.

". . . About four thousand only. Just inside long range," the voice of Spal, finishing a sentence, was coming from the black box. "Request fire permission."

"Negative," said Mark.

There was a second thunderclap. Then a third. Three specks swam in the blue depths overhead.

"Hand-weapon groups ready," said Mark into the phone.

"Ready, sir," said Brot's voice.

One of the specks seemed to jerk away from the other two. Then it commenced falling in a long shallow curve that at first looked as if it would take the ship out of sight over



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the horizon. But then the speck slowed its fall and began to grow larger. It swelled before them to a dot, to an egg-shape, to an oval—

"Hand-weapons group, fire at Command," said Mark.

"Understood."

The tiny shape of the Meda V'Dan ship seemed just above the horizon. Suddenly, it leaped at them from that position.

"Fire!" The voice of Brot came from the loud-speaker box.

White fingers of light—bright even in the growing daylight—stretched up from the clumps of trees immediately surrounding the station, rising from all sides until they met in an apex area just above the station buildings. The light fingers hung there like a tent of searchlight beams; and the attacking Meda V'Dan ship flicked through them.

The ground jarred to the impact of another air concussion and the rolling battering of several heavy explosions. Then the attacking ship was gone and three of the station buildings, including a corner of the Residency, were burning. The flames flickered with difficulty against the smothering effect of the athermal coating, sprayed on all exposed surfaces the day before. A little smoke rose.

Down in the landing area, one of the standing scoutships showed a black gash in its side from which little flames licked.

"Cease fire," said Brot. "Report, group captains."

There was a momentary pause.

"Hand-weapons report," came Brot's voice again. "Sir, no group hit, no one hurt. Of course they didn't expect we'd be out here, firing back. Next time we'll feel it."

"Change position of groups."

"Accomplished already, sir."

"Fine. Guns?"

"Sir," said Spal's voice again.

"Stand ready," said Mark. "The bandits know we've got men with hand-weapons around the station, now. They'll probably try a run of all three ships, first. If they do, hold your fire and leave it to hand-weapons. We want to force them to come in and hang so close you can't miss, before we let them know you're there. On straight runs like these last, they'll have trouble hitting the hand-weapon positions."

"Coming," Paul's voice was almost an interruption, it followed so closely on Mark's last words to the ex-Marine. "All three!"

"Hand-weapons, fire at group command," said Mark. "Guns, ships—hold fire."

The three specks were now falling toward the horizon together. There was a moment of breathless waiting and then all three sprang past above the station at eye-baffling speed. The triple thunder of their passing concussion stunned the people on the ground.

Once more the tent of hand-weapon beams had lifted over the station buildings, and the buildings this time showed no new damage.



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But treetops in every clump of trees for half a mile from the station were burning.

"Cease fire," said Brot's voice. "Report, captains."

"Got their index that time," Paul said. "Complete readout. They run four to six light weapons apiece amidships. Seventeen mounted weapons among them all."

"Ships, Guns, Hand-weapons?" said Mark. "Did you hear that, all of you? Ships, you look out for those midship weapons in particular when you tangle with the bandits. In close, they can do as much damage as the big guns fore and aft."

"Two groups wiped out," said Brot, his hard voice unchanged in tone. "Six of ten dead in another. All other eight groups untouched. We hit anything?"

"Paul?" Mark looked over at the other Outposter. Paul glanced over the instruments to his right.

"Readout index shows some damage to the third bandit to pass," he answered. "Hull maybe pierced just ahead of the drive units. Could be crippling hit, could not. Other bandits just scarred."

"Sir," said Brot. "With permission, will change my fire patterns."

"Go ahead," said Mark.

"Thank you, sir."

"Here they come," said Paul.

Once more there was the thunder of passage and the tent of white beams—a tent now elongated in shape. Staring up toward the western sky, Mark saw the three specks climbing—the last one lagging behind the other two.

"Think we hurt him?" Mark looked at Paul.

"Index inconclusive," Paul answered. "Could be."

"Guns," said Mark into the phone. "Alert on next pass. We may have a cripple."

But the concussions of the next pass shook them, unchanged. And the specks climbing the western wall of the sky afterward held tight formation.

"Two additional groups hit hard," said Brot. "Four lightly. Two untouched. Six groups now operational. Moving all groups."

"Sir," said Spal. "The bandits are running the same pattern over us each time. I can get two of three."

"Negative," said Mark. "Repeat negative. Your two weapons represent our only really effective firepower source. Hold until ordered."

"Sir."

"Paul," said Mark, looking at the other Outposter. "Nothing more on index about that third bandit's damages?"

Paul shook his head.

"Coming again," he said.

"Stand by," Mark told the phone. "Hand-weapons, fire at group command. All others hold."

Once more, the passage of the Meda V'Dan ships. The tree clumps had also been sprayed with athermal against the Meda V'Dan fire weapons, but most of them were now blackened and scorched badly, and



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three of them had ceased to exist, looking as if the place of their growth had been trampled by some great, burning foot.

"Five groups operational," said Brot's unemotional voice.

"They won't keep this up too long," said Mark, half to himself, half to Paul. "They can't land as long as the hand-weapon groups are there; and they can't wipe the hand-weapon groups out without slowing down on their passes or hovering above the station." He picked up the phone.

"Guns, Ships, Hand-weapons?" he said. "Attention. Be alert for change of tactics by bandits on next pass."

"Coming," said Paul.

"On their way, now," said Mark into the phone.

Triple thunder echoed as the Meda V'Dan ships flashed past at the same speed as before.

"Light hits," said Brot's voice. "All six groups now operational—*look out, they're back!*"

The Meda V'Dan ships were suddenly above the station once more. They had flipped just below horizon level and returned. They skidded to a stop in mid-air some five hundred feet above the station and its surrounding area.

"Guns!" called Mark. "Fire at will!"

With sizzling roars, two thick white ropes of incandescence reached up from tree clumps nearly a mile on either side of the station buildings. One Meda V'Dan ship, touched squarely in the belly by the discharge of the fixed weapon on the Command Post side of the station, fell out of formation immediately, yawing and corkscrewing earthward until it landed in a long, slewing slide and lay still, a black gape in its hull smoking.

The ship, touched by the far plasma rifle, slewed about, lost altitude, but then pulled up and tried to turn back away from the position of the rifle that had damaged it. But this brought it again over the station and the hand-weapons scored it.

"Ships!" Mark was shouting into the phone. "A cripple! Take it! Quick—but keep low."

He glanced at the third, the untouched Meda V'Dan vessel which was now climbing swiftly, unhurt into the eastern sky. But it showed no sign of turning back to rescue its partner ships.

"Paul—monitor that one getting away," said Mark. His voice was drowned in the howl of torn air as the two hidden scoutships flashed into view over the horizon.

At the sight of them, the cripple tried once more, desperately, to gain altitude. But the effort evidently exhausted its damaged drive capabilities. Its nose dropped and it went earthward in a long slant to avoid the guns of the two scoutships closing in upon it.

"Cease fire, Ships! Cease fire, all but hand-weapons covering down bandits!" shouted Mark. "Hand-weapons return fire from bandits." He turned to Paul.



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"What about the third one, Paul?"

"Going . . . gone," said Paul, pointing at the scan cube. "He's not even stopping to orbit out."

Mark straightened up. For the first time he realized he had spent the whole time of the battle crouched over the phone and the instruments. His back felt stiff and painful; and when he closed his mouth after speaking, his teeth gritted together.

He became conscious of the fact that there was dust in his mouth. In fact, the whole area between himself and the station—and probably beyond as well for an equal distance—was hazed with smoke and dust. He looked at Paul and saw that the other man was gray-faced with dust, as was Ulla, when he turned to look at her.

She was sitting motionless against the vertical dirt wall of the pit. He stepped over and held out his hand.

"It's all over," he said. "I'll take you back to the Residency, now; or some place else, if that's been burned out."

She took his hand and let him lift her to her feet without a word.

"Be with you in a second," he said. "You can get in the ground car."

He turned back to Paul, who was pulling connections on some of the communications equipment that was now out of operation.

"Better keep somebody on watch at the scan cube for the next few days, just in case," Mark said. "The rest of the equipment can go back up to the station without waiting."

Paul nodded.

Mark turned away and went back to Ulla, who had taken the opportunity to get some of the dust from her hands and face. Silently, they climbed out of the pit and got into the ground car, together. Mark put the vehicle in motion, swung it around and headed back toward the Residency.

Ulla said nothing until they were almost back at the Residency, which it seemed had suffered only the mild initial damage sustained on the first Meda V'Dan pass. But when she did speak, her words were disconcerting.

"That business you mentioned about the people hanging you high in the sun when they were through with you, to teach others that they weren't easy to serve," she said, "do you really think something like that might happen to you some day?

He looked at her; but her face was honestly troubled and questioning.

"I know it will," he said.

She looked to her front again; and a moment later he drew the car up in front of the Residency's main door. She got out without either of them saying any more to each other; and he wheeled the car away to supervise the beginning of the cleanup—for a little while before exhaustion finally claimed its right and sent him staggering to his bed.

TO BE CONCLUDED



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# the reference library

*P. Schuyler Miller*

*LEM*

In the introduction to his anthology of Iron Curtain science fiction, "Other Worlds, Other Seas," Professor Darko Suvin of McGill University called the Polish writer, Stanislaw Lem, "the most significant European SF writer today" and "the one who should be most congenial to a sophisticated reader of Anglo-American SF." Professor Suvin is a Jugoslav who has written a massive study of science fiction, yet to be put into English. If no American or English publisher takes the step, perhaps a Canadian will. He should know. In any case, you can begin to form your own opinion, because Walker and Company have published a translation of one of Lem's most important novels, "Solaris" (216 pp.; $4.95—with a meaty and tantalizing appendix on Lem's work by Professor Suvin). You'll find it quite different from the four short stories in the anthology.

I have complained, when reporting on some of the collections of Soviet Russian science fiction we've been getting, that the writers seem to be at the stage where American and English writers found themselves in the late 1930s and early '40s. An American archeologist of the new school might call it "Formative." This is still true of the short stories, but it certainly is not true of "Solaris," which is as modern as the most original paperback you'll find in the Ace Special or Ballantine list.

Among other things, "Solaris" disproves the axiom that you can't mix themes successfully in science fiction. All that old saw means is that some, or most, *writers* can't mix "hard" science with the structure of a detective story, flesh it out as a chronicle of psychological turmoil, and get away with it. We have Isaac Asimov and "Caves of Steel." We have Ursula Le Guin and "The Left Hand of Darkness." Poland has Stanislaw Lem and "Solaris."

Solaris is a very distant, very strange world where an elaborate research station is getting nowhere in its study of the planet's "sea." This is the book's scientific gimmick, and an impressive one it is—a planet-covering organic soup of a kind that might have developed on Earth if



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our primordial sea had never differentiated into microorganisms. It is one colossal being with unimaginable motives, powers, purposes. Scientists have pried and probed at it, bombed it, irradiated it, all in the name of "communication" . . . and all to no effect.

Rather, to no effect that men can understand. For the sea has an elaborate program of activities, building strange structures, dissolving them, remodeling them. And when protagonist Kelvin reaches the almost deserted research station, he finds that it can also construct human simulacra out of a man's darker dreams. The dead Gibarian has been given a handsome black companion who sleeps with his frozen corpse in the locker. The other two survivors have golems we never see. Kelvin's companion is a counterpart of his dead wife, fleshed out of his memories of her. But—as in the memorable film, "Forbidden Planet," dredged-up memories can be dangerous.

If you think this book demonstrates that Stanislaw Lem is a Polish Sturgeon, get "Other Worlds, Other Seas" and read his four short stories there. In the critical and biographical appendix to "Solaris," Professor Suvin explains that these stories come from three series that Lem has been writing over a period of years. One cycle, represented by two episodes from "The Star Diaries of Ion Tichy," is supposed to be his most popular. Tichy is a space-roving hero with a bizarre sense of humor, somewhere between Gulliver and the comic heroes of the stories Hugo Gernsback liked to publish (and write) in World War I days. Gernsback was European—a Luxembourger—and he and Lem may have been drawing on the same heritage of peasant humor, broad yet sharp, that also produced Gangantua and Pantagruel and—as Darko Suvin points out—Candida.

A second series, the "Pilot Pirx" stories, is represented by one story, "The Patrol," in which the translator calls him "Pirks." This is the nearest to an Analog-type scientific puzzle story that we see—though "Solaris" is developed in the manner of a detective story. Pirks, or Pirx, finds out—almost at the expense of his life—why pilots have been vanishing.

Last, and least, is a little fantasy, an allegory, a playful vignette, "The Computer That Fought a Dragon." This is one of a cycle of such yarns that Professor Suvin calls "robotic fables." They are apparently old Eastern European folk tales recast in modern cybernetic form.

Playful fantasy . . . scientific puzzles . . . rather heavy-handed satire . . . psychiatric projection: Lem does them all well—which is Professor Suvin's point. I hope these books sell well enough so that we will see more from his massive backlog.

## THE SCIENCE FICTION BOOK CLUB

I am constitutionally opposed to book clubs. As a book nut, I like to



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have crisp, new first editions, and most book club editions are reprints with inferior paper and binding. But there are exceptions, and Doubleday's Science Fiction Book Club seems to be one of them. After all these years, I've joined.

I have not reviewed Book Club books here for the simple reason that you can't buy them—except from a used book dealer—unless you are a Club member. Then you pay anywhere from $1.49 to $1.98 for books whose original editions sold for $4.95 and up. No question about the bargain, unless you're a collector like me.

But—collectors take notice—it finally got into my thick skull that the Science Fiction Book Club is also publishing hardbound editions of original paperbacks. True, some of these books have had hardback editions in England, but most of them haven't, and most of you—like me—have no easy way to get new English books, unless you're in a city like New York which has its own British bookstores.

I joined the S.F. Book Club last year to get its new edition of Edgar Rice Burroughs' first three Mars books with new illustrations—beauties—by Frank Frazetta. I've been buying pretty regularly, and always hardbacks of paper originals, or others that I missed because my bookstore couldn't get 'em: John Brunner's "The Jagged Orbit." Philip K. Dick's "Galactic Pot Healer." Harlan Ellison's "The Beast That Shouted Love at the Heart of the World." The Wollheim-Carr "World's Best Science Fiction" anthologies. When I report on the paperback here, I'll also mention the Book Club edition if I know about it. Meanwhile, answer one of their ads. You really have to buy very few books during the year to keep their announcements—a little booklet called "Things to Come"—coming to you. And you may be able to get books that you can't get, new, in any other way—the Frazetta/Burroughs Mars books, for example. Or an original sword-and-sorcery fantasy that they've just announced, "Red Moon and Black Mountain" by Joy Chant.

I wonder what I've missed.

**GADGET MAN**

*By Ron Goulart • Doubleday & Co., Garden City, N.Y. • 1971. • 161 pp. • $4.95*

This is a kind of sequel to last year's hilarious "After Things Fell Apart," and not as good. What's more, you really have to know California to appreciate it fully.

Both books are set in California, in a society which has patched itself together after an abortive Chinese invasion of the west coast. (Did Goulart tell us earlier that the Taiwan Chinese jumped on the bandwagon with the Reds, in the hope of sharing in the pickings? If he didn't, I think it's implied.) With the total breakdown of society, the country has developed into a mosaic of mi-



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crosocieties, and California's zany cliques and claques have made the most of the trend.

In the first book, a San Francisco cop chased clues and people in and out of a bewildering hodge-podge of these crystallized bedlams. In this one, another cop is sent out to try to find out what is stirring up senseless rioting and vandalism throughout the Republic of Southern California. The daughter of a guerrilla leader is supposed to have information for him—but that is only the beginning of the paper-chase in and out of insanity, in search of the mysterious Gadget Man and whatever gadgets he may be using to drive people wild.

It's fascinating, but not quite so fascinating as the previous book.

**THE YEAR OF THE CLOUD**

*By Ted Thomas and Kate Wilhelm • Doubleday & Co., Garden City, N.Y. • 1970. • 216 pp. • $4.95.*

It's getting harder, these days, to find a good "hard" science-fiction novel in which technical projection is the core of the story. It's even harder to find a world catastrophe story in which the physical and social destruction of men and landscapes isn't purely perfunctory. Well, here is one.

Books gestate too long for this one to have been inspired by the recent "polywater" or "anomalous water" controversy, unless Ted Thomas was in on its earliest stages. More probably he has been fascinated by the incredible behavior of some of the gelling agents that you see advertised in the chemical trade magazines. I haven't checked to find out whether his "POE"—polyoxyethylene, with unknown side-chains—is one of them.

At any rate, Earth plows through a cosmic cloud which fills the atmosphere, and eventually the seas, with the stuff. And little by little the viscosity of the world's water begins to rise—and rise—and rise. Fishes can't swim. Blood won't flow. And with increasing, almost exponential speed human society crumples and the chain of life begins to come apart.

We watch the world collapse over the shoulders of two sets of observers, mutual friends who are together as the book starts and the effects of POE-water are first discovered. One, the least involved until late in the book, is Carl Loudermilch, one of the country's top science writers, whose background and experience enable him to interpret what he sees and extrapolate what is coming. The other is a trio who come together accidentally and find themselves held together: a biologist, a playboy photographer, and the girl who has been living with him on his boat in the Caribbean. Kate Wilhelm may be responsible for the human relationships—theirs, and Loudermilch's with a kookie youngster he picks up in California and brings back across the country to watch New York decay.

Perhaps it is intentional—though



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looking back, it seems to me that many world catastrophe stories have the same quality—but the book has an odd quality of unurgency, as if the characters were wading waist-deep in a tank of POE-water. The most violent action is embedded in a kind of nightmare unreality. It may very well be that catastrophe is like that, and if so, the authors have caught the atmosphere beautifully. Wells' most lively action had some of this quality. J. G. Ballard's catastrophes do, too. Perhaps it's an air of fatalism—the feeling that the universe has gone out of control, and that there is nothing to do but ride with it.

Is ultimate melodrama really so undramatic? Maybe that is the real theme of the book.

**RINGWORLD**

*By Larry Niven • Ballantine Books, N.Y. • No. 02046 • 342 pp. • 95¢*

In this long space adventure yarn Larry Niven draws together many of the threads he has spun in his earlier stories about the expansion of mankind through the galaxy, and the bizarre races that it encounters—the ferocious *kzin*, the cowardly three-legged, two-headed puppeteers, the starseeds, and others. ("Neutron Star," which covers some of this ground, is also out as a Ballantine paperback.)

Earlier in the chronicle, the puppeteers have inveigled a human adventurer into visiting the center of the galaxy in a faster-than-light ship. He found that it was exploding, so the entire race of puppeteers took flight for a refuge in the Magellanic Clouds. (How they did it, and the location of their mysterious home world, are revealed in this book.) En route, the puppeteers made a number of disturbing discoveries; being pragmatically cautious about risking their own hides, they sent one of their maniacs to assemble a crew of explorers to find out what the Ringworld is—a two-hundred-year-old adventurer, a somewhat inhibited *kzin*, a young girl who has been bred for luck, and his terrified self.

The Ringworld, when they do find it, is a cosmic marvel that they barely nibble at in the course of the long book. Like the neutron star that gave its name to the earlier book, this is one of Niven's adept applications of 'way-out astrophysics. An ancient race has solved its population explosion by building a synthetic world in the form of a colossal ribbon, a million miles wide, orbiting a central star, with convenient forces holding an atmosphere, seas, soil, *et al* on the sunward side, and a literal chain of sunshades to give it occasional darkness. But the engineers, who created all these marvels, and the puppeteers dread to find as rivals when they reach their extragalactic haven, have vanished. The Ringworld is a mosaic of degenerate hamlets, roving tribes, and broken-down wonders which the space-wrecked explorers encounter in turn in the manner of one of Edgar Rice Burroughs' better ex-



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travaganzas. Only Niven's marvels have a plausible physical explanation, whereas Burroughs neither knew nor cared much about feasibility studies.

You'll find yourself exasperated that the crew really learn so little about the Ringworld. Then you'll look at the thing quantitatively, and begin to realize how big it is, and how long it would take to explore one little portion thoroughly. If he wants to, Larry Niven can write a hundred times more Ringworld stories than there are recorded and unrecorded adventures of Tarzan or Sherlock Holmes.

### THE YEAR OF THE LAST EAGLE

*By Leona Train Rienow with Robert Rienow • Ballantine Books, N.Y. • No. 02065 • 246 pp. • 95¢*

The Rienows, husband and wife, were hard workers in the environmental cause long before it had become intellectually fashionable. In those days, it was called "conservation," and most liberals snorted at it as elitist, undemocratic—you name it. The word "ecology" was known only to the elitist few—I remember one of the country's top ecologists complaining that he could not find a college that would teach his son what he had taught himself.

Now that the environment has become, however temporarily, an "in" cause for those bored with ordinary causes, Mrs. Rienow, with an unspecified assist from her husband, has written a science fictional comedy of life in upstate New York and environs in the year 1989, the Bicentennial of the Establishment of the American Republic. After more than two hundred years, the aforesaid Establishment has decided to un-table the bill making the White-Headed Eagle our national bird . . . only there may not be an eagle left when the official act takes place.

The job of preserving the last eagle or eagles is assigned to one-time ornithologist Alec Fitzsimmons, veteran of ten years on the synchronous communications satellite Teleburp, and a temporary national hero. Back on Earth with rubber legs, he struggles to accommodate himself to life in the megalopolis of Bosnywash, where you get a one-minute shower once a week—the rivers are dried up; eat synthetic food—unless you have plenty of money; wear an oxygen mask—unless you want to fall on your face; and do daily battle with the psychiatrists who would dearly like to scrub out your phobias. He also finds, in a corollary of Parkinson's Law, that bureaucracy has kept pace with the population—and then a little. It is bureaucracy that destroys the last eagles after Alex has taken steps to protect them.

The book isn't a great comedy—the Rienows are basically serious writers—but there are very few facets of our polluted world that it fails to etch with assorted acids. One statement might sum it all up: it's no joke!



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## SCIENCE FICTION COLLECTIONS INDEX

*By Len Collins • Order from Arthur Hayes, Box 1030, South Porcupine, Ontario, Canada. • 75¢*

Len Collins is a Tennessee fan who compiled this reference work for the National Fantasy Fan Federation (N3F). Most of the edition was distributed among members of the Federation—just as scientists distribute reprints of their papers—but Hayes, in Canada, is said to have a supply at the price quoted.

This is a very much needed work that doesn't go far enough. We've had Walter Cole's "Checklist of Science Fiction Anthologies," but for every anthology there have been two or three collections of individual authors' short stories and novelettes—and some authors write very little else. Collins' listing is alphabetical by author, then chronologically in order of publication, with the contents of each book listed. He hasn't tackled an author or title index, which would be an enormous chore. He has included some collections that are more mystery or adventure stories than fantasy or science fiction. (Yes, he covers both.)

But the biggest shortcoming of the job as a reference work is that paperback collections aren't included—and they now make up the vast majority of such books. Maybe, with help and time, Len Collins, or someone else, will take on the bigger job and find a publisher to put it between the hard covers it deserves. If you're inclined to help, get in touch with: Carroll L. Collins, Route 4, Box 148, Church Hill, Tenn. 37642.

## A CHECKLIST OF ASTOUNDING: PART 3—1950 to 1959

*Compiled by B. T. Jeeves, 230 Bannerdale Road, Sheffield S11 9FE, England. • 52 pp. • $1.50 (10 s)*

I evidently didn't get the first two parts of this labor of love, or didn't get it into the department. Part 2, the compiler tells us, came out in 1965.

Terry Jeeves has assembled a neatly reproduced booklet that contains: (1) a listing of the contents of all issues of Astounding from January 1950 through December 1959; (2) an alphabetical index to the stories published in the ten years; (3) a title index to factual articles; (4) an author index; (5) an unusual index of John Campbell's editorials, issue by issue, with an extraordinarily terse précis of each, plus the names of the cover and interior artists who illustrated the issue; and (6) a couple of pages of pseudonyms, culled from various compendia of fact and rumor.

I'm crushed. "The Reference Library" is not indexed as either fact or fiction.

The edition is limited to 150 copies, and I don't have the name of a U.S. dealer who may have them for sale—though you never go wrong if you try F & SF Book Company, P.O. Box 415, Staten Island, N.Y. 10302.



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**EDITORIAL**

*continued from page 7*

landers to the Moon, and land safely pretty considerable masses of equipment on the Moon. Both must land successfully within a small distance—not over 100 miles, let's say—of each other. If either one fails, the other won't have much use.

Those two big vehicles aren't going to be such a hell of a lot cheaper than an Apollo flight, actually, when you take into account the fact that they're going to be totally dependent on a great deal of very complex technical equipment—and that there will be no glitches, only disasters.

The first Russian effort to bring back a sample of the Moon was timed to get there just ahead of Apollo 11; it was a good try, but some minor glitch ballooned into a disaster; it didn't soft land, and they had to crash it on the Moon.

In accounting the comparative cost of manned vs. unmanned probes to the Moon, any honest accountancy outfit would have to tack on a huge fee as the insurance cost—and that might make the economics of the thing stop looking quite so one-sided! Particularly when you add the requirement that the product—samples returned to Earth—must be of comparable magnitude and value.

On the matter of bargain prices, one might note that the Apollo program could have saved several thousand dollars by using some of Kodak's $10 Instamatic cameras, instead of the expensive Hasselblads. They're both cameras, aren't they?

While it's true that television-controlled-from-Earth Lunokhods do permit the chair-bound explorers to select samples by seeing them on TV, and operating Lunokhod's manipulators, there's a problem. The quality of color TV pictures the cameras of the Apollo 11 and 14 missions sent back to Earth are certainly enormously inferior to the quality of the photographs the men took on the Moon. I wonder how good a job of sample selection could be done via television pictures, how it would compare with the selectivity achieved by trained, observing eyes on the spot?

Apollo 14 was the first of the Apollo shots that was primarily a scientific mission; the previous Apollos, right from Apollo 1 through Apollo 12, were primarily engineering development-and-test missions, seeking to work out the problems involved in a round-trip to the Moon.

Apollo 13 would have been the first mainly-scientific mission—but it turned out to be an unexpected further development-and-test mission, too.

Apollo 11 and 12 did do some immensely valuable scientific work, of course, but the *primary* mission was engineering; did we have a vehicle that would do the job, were the suits workable on the Moon, and were men capable of working well on the Moon in those suits.



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That was a job for test pilots—despite the back-seat-drivers in the scientist department.

Apollo 14 was the first mission wherein scientific exploration on the Moon could get started; Apollo 15 will carry a Moon-car to transport the explorers, and allow of much greater geological study. Apollos 16 and 17 are planned to greatly expand the scientific study of the Moon.

Now one thing of considerable interest has come out recently; the British periodical *New Scientist* carried an article by an ex-NASA astronaut trainee, a scientist who had resigned from the program out of disgusted boredom and a sense of not getting anywhere, explaining precisely why he had resigned. Essentially, it was because he was a trained and qualified scientist, and NASA insisted on giving him courses in circuit diagrams and nuts-and-bolts "How to build an Apollo capsule" which he found extremely repetitive, deadly boring, and completely irrelevant to his interest in scientific study of the Moon.

He was, in other words, of that mental school that learns to drive a car on the basis of "You turn this key thing that way, until the engine starts roaring. Then you push this gimmick here over this way, and then step on this thing, and away you go." It's a mental type that finds the how and why and interaction of mechanism exceedingly boring and uninteresting. It's the inverse of the devoted mechanician who considers theory and mathematics a lot of senseless mumbo jumbo—give him a blueprint and a circuit diagram, however, and he can build the thing so it hums beautiful music.

He quite properly resigned; he might be a hot-shot geologist—theoretical type—but he simply didn't have the type of mind that belonged in anything so complex, so highly sophisticated, and so delicate as a Lunar module.

Perhaps NASA should look for geologists among the mining engineering profession, rather than the theoretical scientist group; at this stage of space exploration every man in the Lunar capsule *has* to be equipment oriented, as well as being a real rockhound.

As NASA has said, it's easier to teach a test pilot the concepts of geology than to teach the pure scientist the necessary appreciation of the intricate mechanism he must share responsibility for.

Moreover, the NASA courses in geology are something very special. The recipe goes more or less like this: you start with a selected man, who has demonstrated an extremely high ability to learn, and learn rapidly. (You don't get to be a first-rank test pilot if you can't learn the characteristics of every new ship you're assigned to test, and learn it fast!) He's also a highly trained engineer, with degrees in various scientific disciplines, and one of the type that learns new material for fun.

Since he already has the basic sci-



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entific disciplines such as physics, chemistry and mathematics, you don't have to spend several years indoctrinating him in how to think in a scientific, objective manner. You don't need to teach him elementary calculus, and spend four years or so getting him started toward geology; instead you devote his time to studying what it is he needs to know. He doesn't need any oceanography; he's going to the Moon. He does need to have a sound knowledge of vulcanism, impact dynamics, rock types, and the dynamics of planetary crustal forces.

And he doesn't get it all from books; he gets taken on selected field trips that are dillies, to see what various type of igneous rocks are like—to see and feel various types of volcanoes and lava flows. He's given a hard-headed, practical, direct-experience cram course in geology.

And starting with a man with demonstrated phenomenal ability to learn—he wouldn't be in the astronaut program if he hadn't already demonstrated that—he can and will learn a lot more geology in a few months than the average university Ph.D. accumulates.

There are a lot of other characteristics that NASA demands of astronauts; after all, they can afford to be exceedingly choosy, because they don't need a thousand of them. Some are obvious; an astronaut must be an athletic man in prime condition; genius intellect won't make up for the inability to wriggle through the LEM hatch in a spacesuit, or a tendency to black out any time the acceleration exceeds 3-Gs. Some requirements are not so obvious, until you think a bit. One man, otherwise fully qualified, was dropped from the program because of a single factor; he suffered from stage fright.

If you consider the sort of glaring public attention the astronauts have to face without blowing up, without stammering some ghastly misstatement, you'll see why it's essential that an astronaut be a cool performer under unlimited attention.

Nevertheless, it's predictably human that many scientists feel that NASA should allow them to run those missions—or give them instrumented probes that they can control the way they just *know* they should be!

Finally, Apollo 14 demonstrated one other thing; men on Earth, logically figuring out what should be done by their agents on the Moon, can not reach the optimum answers. They assigned Shepherd and Mitchell too many, too complex tasks, and too many definite "go here, do this, then collect that . . ." detailed tasks. That much could not be accomplished under the harsh, difficult conditions.

Men on the Moon can do a better job of self-assignment, because they have the data that no Earthbound man has. If he had it, obviously he wouldn't be so hungry to get it!

Let the Man in the Moon decide what to do next! ■ THE EDITOR



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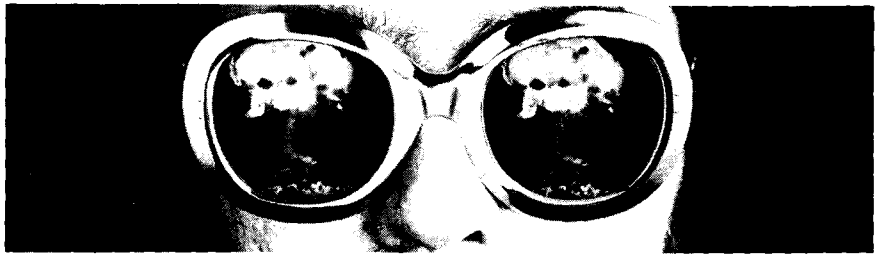

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